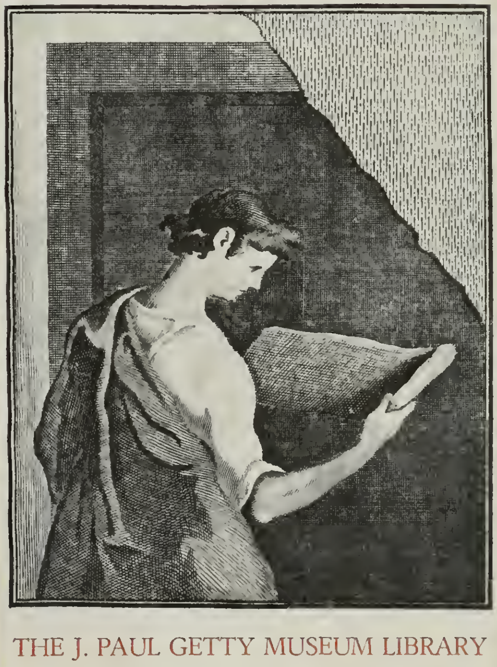

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Dictionarium Polygraphicum:

Or, The Whole

BODY of ARTS

Regularly Digeſted.

CONTAINING,

I. The ARTS of *Deſigning*, *Drawing*, *Painting*, *Waſhing Prints*, *Limning*, *Japanning*, *Gilding* in all their various kinds. Alſo *Perſpective*, the Laws of *Shadows*, *Dialling*, &c.

II. *Carving*, *Cutting* in Wood, Stone; *Moulding* and *Caſting* Figures in Plaiſter, Wax, Metal; alſo *Engraving*, and *Etching*, and *Mezzotinto*.

III. A brief hiſtorical Account of the moſt conſiderable *Painters*, *Sculptors*, *Statuaries*, and *Engravers*, with thoſe Cyphers or Marks by which their Works are known.

IV. An Explanation of the Emblematical and Hieroglyphical Repreſentations of the Heathen Deities, Powers, Human Paſſions, Virtues, Vices, *&c.* of great Uſe in Hiſtory Painting.

V. The Production, Nature, Refining, Compounding, Tranſmutation and Tinging all ſorts of Metals and Minerals of various Colours.

VI. The ARTS of Making, Working, Painting or Staining all ſorts of Glaſs and Marble; alſo Enamels, the imitation of all ſorts of Precious Stones, Pearls, *&c.* according to the Practice both of the Antients and Moderns.

VII. *Dying* all ſorts of Materials, Linen, Woollen, Silk, Leather, Wood, Ivory, Horns, Bones; alſo *Bleaching* and *Whitening* Linen, Hair, *&c.*

VIII. The ART of *Tapeſtry-Weaving*, as now performed in *England*, *Flanders* and *France*, either of the high or low Warp; alſo many other curious Manufactures.

IX. A Deſcription of Colours, Natural and Artificial, as to their Productions, Natures or Qualities, various Preparations, Compoſitions and Uſes.

X. The method of making all kinds of *Inks*, both Natural and Sympathetical; and alſo many other Curioſities not here to be ſpecified, whereby this is rendred a more Compleat Work than has hitherto appear'd in any language.

Adorned with proper Sculptures, curiouſly Engraven on more than fifty Copper Plates.

VOL. I.

LONDON:
Printed for C. HITCH and C. DAVIS in *Pater-noſter Row*, and
S. AUSTEN in *St. Paul's Church-Yard.* MDCCXXXV.

PREFACE.

THE Arts to which theſe volumes are an introduction, are ſo amiable in themſelves, and unfold ſuch a variety of advantages and delight to mankind, that we hope our endeavours to range them in a regular view, and render them intelligible even to a moderate capacity, will not be thought an unneceſſary undertaking.

We have caſt this work into the form of a Dictionary, becauſe we judged ſuch a diſpoſition the moſt methodical of any, and as we are ſenſible that clearneſs of expreſſion is eſſential to thoſe performances which are publiſhed with a view to illuſtrate the Arts and Sciences, we have always endeavoured to treat our ſubject with that perſpicuity, as we flatter our ſelves will not diſappoint the reader's expectation of improvement.

It has been our conſtant method to conſider each particular Art in the rudiments from which it flows, and to trace it from thoſe original principles to its perfection: In the conduct of which deſign, we have advanced in that regular gradation from rule to rule, as is neceſſary to convey a diſtinct idea of every circumſtance which deſerves obſervation, and, at the ſame time, have endeavoured to preſerve the due medium between an affected conciſeneſs which is generally obſcure, and a looſe redundancy which always ſatiates.

We have likewiſe, for the ſatisfaction of the curious, given a particular account of the materials employed in thoſe mechanic arts which have a place in this work; and have added directions for proper applications of them in every branch of the Arts to which they are appropriated: We have alſo conſidered theſe materials, not only in their firſt ſhape of nature, but have attended them through every proceſs of art, preparatory to their laſt forms in the ſhops of Colourmen, Druggiſts, and other tradeſmen; and have laid down proper rules for diſtinguiſhing the pure and genuine materials from thoſe which are adulterated and ſpurious.

As it was our intention to render this work, at once, inſtructive and entertaining, we have interſperſed ſeveral hiſtorical accounts of the greateſt maſters in theſe Arts; we have marked their ſeveral characters and peculiar turns of genius; we have pointed out their particular methods of ſtudy, and conſidered the amazing heights to which they raiſed the various Arts they profeſſed; in a word, we have introduced all the uſefull variety we could collect, to make this article pleaſe the imagination, and inform the judgment.

Our obſervations have been carefully collected from the moſt celebrated authors. and digeſted into ſuch an eaſy and regular ſeries of inſtructions, that thoſe Gentlemen who are diſpoſed to conſider them with attention, will be agreeably ſurprized at their ſpeedy proficiency in ſuch engaging ſtudies, and will find the theory and practic part of theſe beneficial Arts attainable much ſooner than they might poſſibly expect. We may likewiſe add that the expence of purchaſing, and the tedious fatigue of conſulting a vaſt number of volumes on theſe ſubjects will be rendered unneceſſary, ſince we have included, in this work, all the material precepts and informations that are to be drawn from every valuable treatiſe on theſe ſubjects, already extant.

As the intention therefore of this work is to familiariſe theſe charming Arts to the laudable curioſity of all who wiſh for a competent proficiency in them; and as we have formed it, from the beſt authorities, in ſuch a ſyſtem of inſtruction as has a direct tendency to produce that effect, in a more agreeable and compendious manner than has yet been attempted, we hope no objection of any moment can be rais'd againſt it, to prevent its obtaining a favourable reception from the publick.

THE

Polygraphick Dictionary.

A.

A. B. Theſe two letters join'd together with an E iſſuing out from the B, is the mark of *Alexander Badiale* of *Bologna*, painter and engraver.

AB. BL. *in*, ſtand for *Abraham Bloemart*, an indefatigable *Dutch* engraver.

A. BOTH, ſtands for *Andrew Both.*

A. C. P.
A. C.
AGOS. C.
AG. C.
AG. Bononiæ,
Are all the marks of *Auguſtino Caracci* of *Bologna*, a celebrated painter and engraver.

ACADEMY of PAINTING was eſtabliſh'd in *France*, about ſixty years ſince, in the reign of king *Lewis* XIV, under the cardinal *Mazarine*, the firſt protector thereof; and the chancellor *Seiguer*, vice-protector.

It conſiſts of a director, a chancellor, four rectors, a treaſurer, twelve profeſſors; counſellors, a ſecretary; a profeſſor of anatomy, another of geometry and perſpective.

Perſons are admitted into this academy, either in quality of *Painters* or *Sculptors*. The *Painters* are admitted according to their reſpective talents; there being a diſtinction made between thoſe who work in hiſtory, and thoſe who only paint portraits or landskips, or beaſts, or fruits, or flowers, or paint in miniature, or only deſign; or engrave or carve.

ACHELOUS the river, is deſcrib'd by *Ovid* adorn'd with a garland of reeds willow and the like: having two urns or earthen pitchers, the one empty, and the other pouring forth water; and having on his head two horns, the one broken and the other whole.

This river as it is the moſt famous of all *Greece*, ſo it divides *Ætolia* from *Arcadia*, and then falls into the ſea.

This repreſentation is taken from the fable of *Hercules*, who combated him in the likeneſs of a bull for the ſake of his wife *Dejanira*, and broke one of his horns; there turning both its ſtreams into one, for which reaſon one of the urns is repreſented empty.

ACTION in *Painting* and *Sculpture* is the poſture of a figure; or the action it is ſuppos'd to be in; expreſs'd by the diſpoſition of its parts, or the paſſion appearing in its face, ſee ATTITUDE and EXPRESSION.

A. D. J. F, ſignifies *Anthony Jacquart* fecit. He engrav'd ſeveral pieces.

ADAMO, a ſculptor of *Mantua*, engrav'd the angels of *Michael Angelo Buonoroti*, in ſeventy three plates, and work'd for other maſters, and mark'd his plates with the mark. See plate No. 1.

ÆGIPAN, [of 'Αἴξ ἄιγος, gr. a goat] a denomination given to the Heathen god *Pan* and the *Panes*, on account of their being repreſented in painting with the horns, legs, feet, *&c.* of that animal.

Salmaſius in his notes on *Solinus*, takes *Ægipan* to have ſignified the ſame in *Lybia* with the *Sylvans* among the *Romans*.

Voſſius oppoſes this opinion, and ſhews that the *Ægipanes* had not faces like men as the *Sylvans* had; but like Gods. In effect the whole upper part of the body reſembled that animal; and as to the lower, they painted it with a fiſh's tail.

AÆ. ADAM ÆLZHEIMER, who wrought with *Peter Bruguel*, mark'd his pieces with the preceding mark. See plate No. 1.

ÆNEAS, the *Trojan* prince, is painted in a purple mantle trim'd with gold.

ÆOLUS is depicted with ſwoln, blubb'd cheeks, like one that with main force ſtrives to blow a blaſt; two ſmall wings upon his ſhoulders, and a fiery, high countenance.

He is by the poets feign'd to be the god and ruler of the winds, whoſe deſcriptions are to be found under their proper articles alphabetically.

ÆS USTUM, to make. Take bits or thin leaves of copper fifteen ounces, ſulphur in powder ten ounces, ſea ſalt finely powdered fifteen ounces, fill the crucible by laying in layer upon layer; put it into a furnace of live coals, and let it ſtand till the ſulphur is wholly conſum'd; then take it out, and it will be of an iron grey, but reddiſh within; it gives a noble fine tincture to glaſs.

Another Æs Uſtum. Take thin plates of the reddeſt copper (*i. e.* the roſe copper) make it red hot, and extinguiſh it in urine, in which common ſalt has been diſſolv'd: reiterate this operation till it becomes of the colour of gold, both within and without; after which cement thoſe places with this powder. Or

Take ſulphur two pound, ſalt petre two pound, vitriol calcin'd to redneſs one pound, reduce all to a powder, put the plates with the powder into a crucible layer upon layer, cover it with another crucible having a whole in the bottom, lute them together, and being dry, put them into a circulatory fire (having hot embers underneath) for ſix hours: for the firſt two hours let the fire be a foot diſtant from the crucible; the ſecond two hours let it be half a foot from the crucible, and the laſt two hours let it be cloſe to the crucible, cover it.

Take care that the fire be not too violent, that the matter may not melt, for if it does it is ſpoil'd. When it is cold reduce it to a fine powder, waſh it, dry it, and keep it for uſe.

There are other curious perſons who make an *Æs uſtum*, yet finer than this, and more penetrating in colours; but the preparation is more coſtly and requires more time; for inſtead of *brimſtone* and *ſalt-petre*, they make uſe of a purified *ſulphur*, and fix'd with *ſal-armoniac*; and inſtead of ordinary *red vitriol* they uſe *Roman vitriol*, which they prepare with the lee of urine, and a fuſil ſalt; which they afterwards put into a reverberatory.

But ſince the before mentioned will ſerve well enough for colouring glaſs, and are eaſier to make, I ſhall omit giving the preparation of this.

A. F. is a mark found in ſome plates of *Albert Durer*.

AFFECTION in painting is deſcrib'd like a comely ancient lady, winged, holding in her hands a woodcock, and at her feet a lizard.

Her age ſhews ſhe is conſtant, winged becauſe affection is produc'd in an inſtant, the cock and lizard are emblems of *good will* by inſtinct; her poſture ſhews, that benevolence between two for a long time, becomes at laſt one true friendſhip.

AFRICA is repreſented by a *Blackmoor* woman almoſt naked, having frizzled hair, an elephant's head for a creſt, a necklace of coral, and pendants of the ſame; at her ear a ſcorpion; holding in her right hand a *cornucopia*, with ears of corn in her left hand; a fierce lion by her on one ſide, and a viper and ſerpent on the other; ſhe is naked, becauſe it does not abound with materials for clothing; the elephant is an animal with which *Africa* abounds; as it alſo does in vipers and ſerpents.

A. G. ſtands for *Albert Glochentonius*, in the twelve plates repreſenting our Saviour's paſſion.

AGATE, a precious ſtone partly tranſparent and partly opake. There are various kinds of *Agates*; which according to their colours, degrees of tranſparency, *&c.* have different names; as the *onyx*, the *chalcedony*, the *black* and the *German-Agates*. The *Agate* has commonly a reddiſh teint; but is finely variegated with ſpots and ſtains, many of which ſeem very naturally to repreſent woods, rivers, trees, flowers, fruits, animals, *&c.*

The *ſardines* and *ſardonyx Agates* are very valuable, the latter is of a *ſanguine* colour, and is divided into zones which ſeem as if they had been painted by art.

Agate has always been eſteem'd for ſeals, as being a ſtone that no wax will ſtick to.

Gold wire drawers burniſh their gold with an *Agate*, whence the inſtrument us'd for that purpoſe is call'd an *Agate*.

AGE in general is repreſented in painting by a lady in a garment of three colours, holding up her hands, with a ſun in her right hand, and a moon in her left; the right being higher than the left; and below a baſilisk erected.

The changeable habit denotes the changing of the minds and purpoſes of ſeveral ages; the ſun and moon intimate their regulating the three principal members, the head, heart and liver, where the vital, animal and natural virtues reſide.

ROBERT AGGAS, a good *Engliſh* landskip painter both in oil and diſtemper; very skilful in architecture, in which kind he painted many ſcenes for the play-houſe in *Covent-Garden*; there are not many of his pictures extant amongſt us; of thoſe that are the moſt conſiderable, is a piece of landskip preſented by him to the company of painter ſtainers, (whereof he was a member) and which now hangs in their hall; he was reckoned amongſt the beſt of our *Engliſh* landskip painters; and died in *London* 1679, and about ſixty years of age.

AGOSTINO a *Venetian*, ſcholar to mark *Antonio Raimondi* in *Rome*, engrav'd the paintings of *Raphael Julio Romano*, and others, us'd the mark plate No. 2. he alſo mark'd with the letters AVI, or AV. 1525.

AGRICULTURE is repreſented in painting with a homely face, but comely notwithſtanding; clothed in a green gown, crown'd with a garland of ears of corn, holding a zodiack in her left hand, and a ſhrub in her right; and a plough-ſhare at her feet.

Her verdant robe betokens *hope*, without which no body would labour. The twelve ſigns of the zodiack, intimate the different ſeaſons which the tiller ought to obſerve; the plough is the moſt neceſſary inſtrument in agriculture.

A. L. P. I. ſtands for *Anthony Licinio Porduore inv. Edward Tualetti*, ſc.

ALABASTER, a kind of ſtone, ſofter than marble, yet harder than plaiſter of *Paris*.

It is found of all colours; ſome extremely white and ſhining, which is the moſt common; ſome red like coral; and other call'd *onyx*, from its colour; which reſembles that of the *onyx*, though very different from it in nature. See ONYX.

Alabaſter cuts very ſmooth and eaſy, and is much us'd by ſculptors for little vaſes, columns, *&c.*

It is alſo ſometimes employ'd like plaiſter of *Paris*: in order to which they burn and calcine it; after which, mixing it up with water to a thin conſiſtence, it is caſt in a mould, where it readily coagulates into a firm body.

Franciſco ALBANI *a Bologneſe*, born in the year 1578, a diſciple of the *Carraches*, one of the moſt agreeable pencils in the world in all parts of painting, but principally admir'd for his performances in little, and had a peculiar genius for naked figures; and the better to accompliſh himſelf for that purpoſe married a beautiful woman, and us'd himſelf to the deſigning of naked *Venus's*, the graces, nymphs, *&c.* and little children, cupids dancing and playing in all the variety of poſtures imaginable. He died *anno* 1660, aged eighty two years.

CHERUBINO ALBERTO *Borghegiana*, i. e. *de Borgo*, S. *Sepulchro* us'd the two marks you will ſee in the plate No. 3, 4. He engrav'd the works of *Michael Angelo* and others.

ALBERT ALDOGRAFT of *Weſtphalia*, a famous engraver, mark'd his pieces with the mark in the plate No. 5.

ALGA is a plant that grows by the ſea ſide, and thence is call'd *ſea weed*, or *ſea moſs*; it is found on moſt coaſts, and is by ſome accounted the excrement or refuſe of the ſea.

This herb, when gathered, if it be kept freſh and moiſt ſome time, will ſhew afterwards its white ſalt on the ſurface of its leaves. The inhabitants of thoſe parts nigh the ſea commonly gather it together on the ſhore, and dry it by often turning it in the ſun as hay is made; after it is dry they burn it, and its aſhes yield an *Alkali* ſalt, fit for making *glaſs* and *alum*. The *Engliſh* make uſe of it for both, and call the aſhes *kelp*.

ALEXANDDR ALGARDI a ſculptor of *Bologna*, mark'd with the mark No. 6. in a concluſion engraven by *Francis du Poylli* in 1653, but at other times made uſe of the ſame mark, but without the G.

ANTONIO ALLEGRI DA CORREGGIO, born in the year 1494, diſciple of *Frari di Modena*, liv'd in *Lombardy*, excell'd in hiſtory painting, died in the year 1534, aged forty years.

ALLUM, } is a principal ingredient in *colouring* and *dying*;
ALUM, } neither of which in many caſes can be well perform'd without it.

It is a kind of mineral ſalt of an acid taſte, leaving in the mouth a ſenſe of ſweetneſs, with a conſiderable degree of aſtringency.

Allum is either native or factitious, the natural is found in the iſland of *Milo*, being a kind of whitiſh ſtone very light, friable and porous, and ſtreak'd with filaments reſembling ſilver.

Factitious *Allum* is made after different manners, according to the different materials whereof it is made.

Allum is of divers ſorts, *red*, *Roman*, *plumoſe*, *ſaccharine* and *burnt*, the three laſt of which are not proper native *Allums*.

Allum is principally produc'd in *England*, *Italy* and *Flanders*.

The *Engliſh Allum* call'd alſo *Roche Allum*, is made from a bluiſh mineral ſtone found plentifully in the hills of *Yorkſhire* and *Lancaſhire*.

The ſtone they calcine on a hearth or kiln, and ſteep it ſucceſſively in ſeveral pits of water; and then boil it for about twenty four hours: laſtly, letting it ſtand for about two hours, the impurities ſubſide and leave a pure liquor; which being remov'd into a cooler, and ſome urine added to it, begins in three or four days to gather into a maſs; which being taken out, waſh'd and melted over again, is fit for uſe.

In the *Allum* works at *Civita Vecchia*, the proceſs is as follows: The ſtone, which is of a ruddy hue, being calcin'd, they boil and diſſolve the calx in water; which imbibing the ſalt, *i. e.* the *Allum*, ſeparates itſelf from the uſeleſs earth. Laſtly, leaving the water thus impregnated with ſalt to ſtand ſome time, it cryſtallizes of itſelf, like *tartar*, about a butt, and makes what they call *Roche* or *Roman Allum*.

The *Swediſh Allum* is made of a mineral which contains a great deal of ſulphur and vitriol, not to be taken away; but by calcination or diſtillation.

The matter remaining in the iron veſſels, us'd in ſeparating the ſulphur from the mineral, being expos'd to the air for ſome time, becomes a kind of bluiſh aſhes, which they lixiviate, cryſtallize and convert into *Allum.*

Allum in colouring and dying, ſerves to bind the colour upon the ſtuffs, and has the ſame uſe there, that gum water and glutinous oils have in painting; it likewiſe diſpoſes ſtuffs to take colour, and adds a degree of briskneſs and elegancy to them, as is ſeen viſibly in cochineal and the grain of ſcarlet.

It alſo preſerves paper, that has been dy'd in its water, from ſinking when wrote upon.

ALLUM } WATER, boil four ounces of *Allum* in a quart
ALUM } of rain or river water, till the *Allum* is diſſolv'd and let it ſtand twenty four hours.

With this water waſh prints you deſign to colour, and it will fix the paper ſo, that the colours will not ſink or run in it, when you lay them on, and will help likewiſe to brighten your colours.

If your paper is very thin and looſe, then waſh it with this *Allum* water four or five times, letting it dry between every time, and your paper muſt always dry before you lay on any of your colours.

But take notice, that if you deſign to varniſh your prints after they are colour'd, then waſh the prints all over equally with white ſtarch before you colour them, and when that is dry lay on the colours.

The method of ALUMING *of ſtuffs, particularly for dying* REDS. Hang rain or running water over the fire, adding one third part of the ſtarch or bran water; put in for every pound of ſtuff two ounces of *Allum*, and an ounce of tartar, and when it boils and froths, firſt skim it, and then put in the ſtuff, ſtir it very well about for an hour, then take it out and rinſe it.

The quantity of *Allum* muſt always be double to that of the *tartar*; ſome dyers reject *red wine tartar*, and uſe only white; others eſteem the red better, eſpecially for crimſons and all browniſh red dyes; and indeed it is very good in all good ſtuffs, that require a little red, preparatory ground, before they are dyed black.

AMALGAMA is a maſs of mercury united and incorporated with ſome metal.

The amalgama of mercury with lead, is a ſoft friable ſubſtance of a ſilver colour. See *lead.*

By waſhing and grinding this amalgama with fair, warm water in a glaſs mortar, the impurities of the metal will mix with the water, and by changing the water and repeating the waſhing again and again, the metal will be further and further purified.

Dr. *Boerhaave* ſpeaks of amalgamation, as one of the greateſt ſecrets in chymiſtry, to contrive to bring off the water at laſt as clear and unſullied as when firſt pour'd on the amalgama, which might afford a method of making the nobler metals, or procuring them from the baſer.

This pholoſophical way of purifying metals may be apply'd to all metals, except iron and copper.

AMALGAMATION is perform'd by fuſing or at leaſt igniting the metal, and in this ſtate adding a proportion of mercury to it; upon which they mutually attract and incorporate with each other.

Gold unites and amalgamates with mercury with the greateſt facility, next to that of ſilver, then lead and tin, and all metals except iron and copper.

The amalgamation of gold is perform'd by heating the *laminæ* or plates of metal red hot, and afterwards pouring quickſilver on them, and then ſtirring the mixture with a little iron rod till it begins to riſe in ſmoke, this is afterwards poured out into a veſſel full of water, where it coagulates and becomes manageable.

This amalgamation or calcination is of great uſe, not only to goldſmiths; but alſo to gilders, who by this operation, render gold fluid and ductil for their uſes. Such amalgama or mixture being laid on any other metal, as ſuppoſe copper, and this afterwards plac'd on the fire to evaporate, the gold will be left alone on the ſurface of the copper or other metal, and is what we call gilding.

The blackneſs that adheres to the amalgama may be waſh'd away with water, and much of the *mercury* may be ſqueez'd or preſs'd out through a linen cloth; the reſt being evaporated in a crucible, the gold will remain behind in an impalpable powder.

Gold will retain about three times its own weight of mercury.

This operation is denoted among chymiſts by the letters A A A.

AMBER, is a yellow, tranſparent ſubſtance, of a gummous and bituminous form and ſubſiſtence; but a reſinous taſte, and a ſmell like oil of turpentine.

It is chiefly found in the *Baltick* ſea; along the coaſts of *Pruſſia*, &c.

Naturaliſts differ widely in their opinions as to the origin of *Amber*, and as to what claſs of bodies it belongs. Some ſuppoſing it to proceed from vegetables, others from a mineral, and even ſome from animals.

Pliny deſcribes it as a reſinous juice oozing from aged pines and firs, others from poplar trees (of which there are whole foreſts on the coaſts of *Sweden*;) and diſcharg'd thence into the ſea; where having undergone ſome alteration it is thrown in this form upon the ſhores of *Pruſſia*, which lie very low.

Some have imagin'd it a concretion of the tears of birds; others the urine of beaſts, others the ſcum of the lake *Cephiſide* near the *Atlantick*; others a congelation form'd in the *Baltick* ſea, and in ſome fountains, where it is found ſwimming like pitch.

Others ſuppoſe it a bitumen, trickling into the ſea from ſubterraneous ſources; there concreted into this form, and thrown aſhore by the waves.

This laſt opinion was for a long time moſt popular, and ſeem'd to have the beſt foundation: but this too is now diſcarded, as good amber having been found in digging the ground, at a conſiderable diſtance from the ſea, as that gathered on the coaſts.

Others take *Amber* to be a compound ſubſtance, and ſay that *Pruſſia* and other countries that produce *Amber*, are moiſtened with a bituminous juice, which mixing with the vitriolick ſalts abounding in thoſe places, the points of thoſe ſalts fix its fluidity, whence it congeals; and the reſult of that congelation makes what we call *Amber*.

The moſt remarkable property of *Amber*, is that when rubb'd, it draws or attracts other bodies to it, and alſo, that by friction it is brought to yield *light* pretty copiouſly. As for the phyſical uſes of *Amber*, it is us'd in making varniſhes for ſeveral uſes.

To make artificial Amber. Boil turpentine in an earthen pot, with a little cotton (ſome add a little oil) ſtirring it, till it is as thick as paſte, then put it into what you pleaſe, and ſet it in the ſun for eight days, and it will be clear and hard: of which you may make beads, hafts of knives or the like.

Another way to counterfeit Amber. Take the yolks of ſixteen eggs; beat them well with a ſpoon; take gum Arabick twelve ounces, cherry tree gum one ounce, reduce the gums to powder, and mix them with the yolks of the eggs; let the gums melt well and put them in a pot well leaded, then ſet them for ſix days in the ſun, and they will be hard and ſhine like glaſs; and when you rub them, they will take up a wheat ſtraw as other *Amber* does.

Another artificial Amber. Take whites of eggs; beat them well, then put them into a veſſel with ſtrong white wine vinegar, ſtop it cloſe; let it ſtand fourteen days, then dry it in the ſhade and it will be like *Amber*.

Another artificial Amber. Break the whites of eggs with a ſpunge, take off the froth, to the reſt put ſaffron, put all into a glaſs cloſe ſtopp'd or into a copper or brazen veſſel, ſet it to boil in a kettle of water, till it be very hard, then take it out and ſhape it to your liking, lay it in the ſun and anoint it often with linſeed oil, mix'd with a little ſaffron; or elſe being taken out of the kettle, boil it in linſeed oil.

To make yellow Amber ſoft. Put yellow *Amber* into hot melted wax well ſcumm'd, and it will be ſoft, ſo that you may make things thereof of what form and faſhion you pleaſe.

Melt ſome *turpentine* in a glaſs in a ſand heat, where the fire may be rais'd at diſcretion, then provide your ſelf with three ounces of *Amber*, either of the whiteſt or yelloweſt ſort.

If you would have the *Amber* white, pick out the cleareſt white pieces, or if yellow the cleareſt of that ſort.

To melt Amber *and caſt it into any figure, with flies or any ſmall animals in it, as is ſeen in thoſe valuable pieces of* Amber *ſold at a great price. from Mr.* Boyle.

Levigate your *Amber*, and ſprinkle in the powdered *Amber* into the melted *turpentine*, ſtirring it all the while with a piece of fir-wood, till you find no reſiſtance; then if you find your melting to reſiſt the ſtick, drop in by degrees a little *Venice Turpentine*, and keep it ſtill ſtirring, till all the powdered *Amber* is diſſolv'd, and is thick enough to pour into moulds; and when it is cold, you will have what figure you propoſe remain as hard as amber itſelf, with all the ſame qualities that amber commonly has.

An Amber varniſh from Mr. Boyle. Take of white roſin four drams, melt it in a clean glaz'd pipkin, then put into it two ounces of the whiteſt *Amber* you can get (finely powder'd) by little and little, ſtirring it with a ſmall ſtick over a gentle fire, till it diſſolves, pouring in now and then a little oil of turpentine; when you find it begin to grow ſtiff, ſo continue to do till all the *Amber* is melted.

But great care muſt be taken that you do not ſet the houſe on fire, for the very vapours of the oil of turpentine will take fire by heat only; but if it ſhould happen to do ſo, immediately cover the veſſel cloſe with a flat board or a wet blanket, and the air being kept from it, it will go out.

It will be beſt to melt the roſin in a cylindrical glaſs in a bed of hot ſand, after the glaſs has been well anneal'd or warm'd by degrees in the ſand; under which you muſt keep a gentle fire.

When the varniſh is made, pour it into a coarſe linen bag, and preſs it between two hot boards of oak or iron, and uſe it with any of your colours, as well as to varniſh them over when they are painted.

AMBER-GREASE is a fragrant drug, which melts pretty much like wax; commonly of a grey or aſh colour; us'd as a perfume, *&c.*

Naturaliſts are of various opinions as to its origin and production,

1. Some ſuppoſe it to be the excrement of a bird, which being melted by the heat of the ſun, and waſh'd off the ſhore by the waves, is ſwallow'd by whales, who return it back in the condition in which it is found.

2. Others take it for a kind of wax or gum, which diſtils from trees, and drops into the ſea where it congeals, and becomes *Amber-greaſe.*

3. Others affirm it to be a vegetable production, iſſuing out from the root of a tree, whoſe roots always ſhoot towards the ſea, and diſcharge them into it.

4. Some ſuppoſe it to be a kind of a ſea muſhroom, which is torn up from the bottom by the violence of tempeſts; it being obſerv'd, that *Amber-greaſe* is ſeldom found, but after ſtorms.

5. Others take it to be a bituminous matter; which is at firſt liquid and runs into the ſea, and is there condens'd and reduc'd to a maſs.

6. Others are of opinion, that *Amber-greaſe* is form'd from the honey-combs, which fall into the ſea from the rocks where the bees had hiv'd or made their neſts; which laſt opinion begins now to be generally allow'd, having ſomething of experience in its favour; ſeveral pieces of it having been ſeen that were half *Amber-greaſe*, and half plain honey-comb; and large pieces have been found, which when broken, honey-comb and honey too, have been found in the middle.

Amber-greaſe is of conſiderable uſe in making perfumes by melting it over a gentle fire, and making extracts, eſſences and tinctures of it.

Amber-greaſe is often adulterated as follows: They take *Ben nuts* an ounce and half, and pound them to a perfect pulp; and add an ounce and half of *ſperma ceti*; beating them well together; then they add *benjamin* in fine powder, *orrice* of *Florence* finely powder'd, and white ſtarch, of each three ounces and a half; bitumen reduc'd to fine powder half an ounce; musk reduc'd to fine powder a quarter of an ounce; *Amber-greaſe* in fine powder three ounces: theſe are mix'd together, with a mucilage of gum *tragacanth* made into a maſs or paſte, and well wrought together with the hand.

Another way of adulterating Amber-greaſe. They take five ounces of the former compoſition, and ſix ounces of *Amber-greaſe*, reduc'd to a fine powder; to which is added a ſufficient quantity of damask roſes: theſe are pounded together in a mortar till they are well mixt, and the maſs is kept to make perfumes with.

AMBITION is repreſented in painting by a virgin cloth'd all in green with ivy branches, ſeeming as about to leap over a craggy rock, on the top of which are ſcepters and crowns; ſhe is attended by a lion lifting up his head. The ivy denotes *ambition*, always climbing higher and ſpoiling the walls; the ambitious ſparing neither the country, religion, nor counſellors, that ſo he may but only become greater than others; the lion is an emblem of pride.

AMERICA is repreſented by a woman almoſt naked with a tann'd or tauny aſpect, having a veil folded over her ſhoulders; round her body an artificial ornament of feathers of divers colours; holding in her hand a bow, and having a quiver on her ſhoulder or by her ſide, and at her feet a human head pierc'd with an arrow, and on the ground a lizard.

Naked becauſe the inhabitants are all ſo; the arms are what both men and women uſe; the human head intimates that they are cannibals, the lizards are reported to be ſo large there, as to devour men.

AMETHIST is a precious ſtone of a violet colour, bordering on purple.

There are three ſorts of *Amethyſts*; the oriental, which is the hardeſt, the ſcarceſt and the moſt valuable, is of a dove colour; the *German* which is of a violet colour, and that of *Carthagena*, which is of the colour of a panſy.

There are ſome *Oriental Amethyſts* alſo of a purple colour, and others white and like the diamond.

There are alſo beautiful ones found in the *Pyreneans*, and the mountains of *Auvergne*.

The *Amethyſt* is not extremely hard; but may be cut with a leaden wheel, ſmear'd with emery moiſtened with water. It is poliſh'd on a pewter wheel with *tripoli*.

It is eaſily engraven on, either in *creux* or *relievo*.

The *Amethyſt* according to *Plutarch*, takes its name from its colour, on account of its reſemblance of new wine mixt with water; and not from its being a preventative of drunkenneſs (as the vulgar opinion has been) which gave occaſion to its being hung about the necks of great drinkers.

To make an artificial AMETHYST. The *Amethyſt* being of a violet colour, proceeding from red and blue, muſt be well imitated to look beautiful.

For this colour take *cryſtal* frit well made with *tarſo* and not ſand, this colour requiring no other; to which add, to each pound one ounce of the following powder, which mix well together before they are put into the pot. See TARSO.

After this you muſt ſet the pot to the fire in the furnace by little and little, otherwiſe the violence of the powder would cauſe it to break.

When this glaſs has been well purified for the ſpace of four days, and it has the colour of an *Amethyſt*, you may work it.

This colour may be augmented or diminiſhed by means of the frit or powder, according to the diſcretion of the workman.

This is the powder which produces the *Amethyſt* colour in glaſs.

Take one pound of *manganeſe* of *Piedmont* prepar'd (ſee *manganeſe*, &c.) and an ounce and half of *zaffer* prepar'd (ſee *zaffer*, &c.) mix them well together, and put the maſs we have ſhewn to each pound of frit, to have a true *Amethyſt* colour.

Or thus; take *ſal alkali* three ounces, powder of cryſtal four ounces, filings of braſs half an ounce, and melt all in a ſtrong fire.

JOST AMMON mark'd his pieces with much ſuch a mark as in the plate, No. 7.

AMMONIACK as *Gum Ammoniac*, or as it is ſometimes, though improperly, call'd *Armoniac*, is a kind of gum brought from the *Eaſt Indies*, and is ſuppos'd to ooze from an umbelliferous plant, *Pliny* calls the tree or plant whence it flows *Metopion*, and ſays, the gum takes its name from the temple of *Jupiter Ammon*, nigh which the tree grows.

Dioſcorides ſays 'tis the juice of a plant, a kind of *ferula* that grows in *Barbary*; and that the plant which produces it, is call'd *agaſyllis*.

In the choice of *Ammoniack*, chuſe that which is of a high colour, and not mixt with any ſcrapings of wood, ſtone or ſand; which is call'd *θραῦσμα*, *i. e.* fraiture: the other which is full of ſtones or ſand is call'd *φύραμα*, *i. e.* mixture.

Sal AMMONIAC is a kind of ſalt more uſually written *Armoniac*.

ANAMORPHOSIS in perſpective and painting, a *monſtrous projection*; or a repreſentation of ſome image, either on a plane or curve ſurface, deform'd; which at a certain diſtance ſhall appear regular, and in proportion.

To make an *Anamorphoſis* or monſtrous projection on a plane.

Draw the ſquare A B C D of a bigneſs at pleaſure, and ſubdivide it into a number of leſſer ſquares. See the figure.

This ſquare or reticle is call'd the *craticular prototype*. In this draw the image that is to be rendred diſtorted and monſtrous.

Then draw the line *a b* = A B; and divide it into the ſame number of equal parts, as the ſide of the prototype A B; and erect the perpendicular E V in the middle of it, ſo much the longer; and draw V S perpendicular to E V; ſo much the ſhorter; as you would have the image be diſtorted.

From each of theſe diviſions draw right lines to V, and join the points *a* and S, as alſo the right line *a* S, through the points *d*, *e*, *f*, *g*, draw lines parallel to *a b*, then will *a b c d* be the ſpace that the monſtrous projection is to be delineated in, which is call'd the *craticular ectype*. See the figures.

Laſtly, in every ſmall trapezium or ſquariſh figure of the ſpace *a b c d*, draw what appears delineated in the correſpondent trapezium of the ſquare A B C D.

By this means you will attain a deformed image, which yet will appear in juſt proportion to an eye diſtant from it, the length F V, and rais'd above its height V S. It will be diverting to manage it ſo, that the deformed image do not repreſent a mere chaos; but ſome other image: thus it has been contriv'd, that a river with ſoldiers, waggons, &c. marching along the ſide of it; has been ſo drawn, that when view'd by an eye in the point S, it appear'd to be the ſatyrical face of a man.

Plate. I.

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Fig. 2.

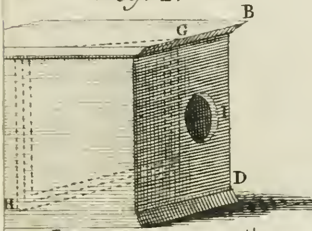
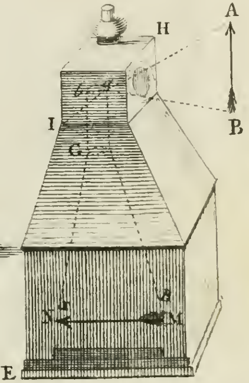
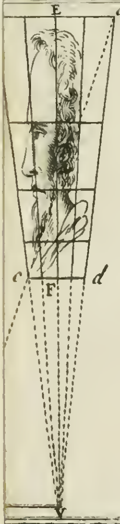


Fig. 3





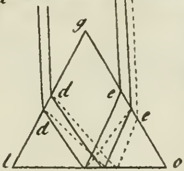


Fig. 9.

Fig. 4.

Anamorphosis

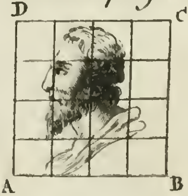
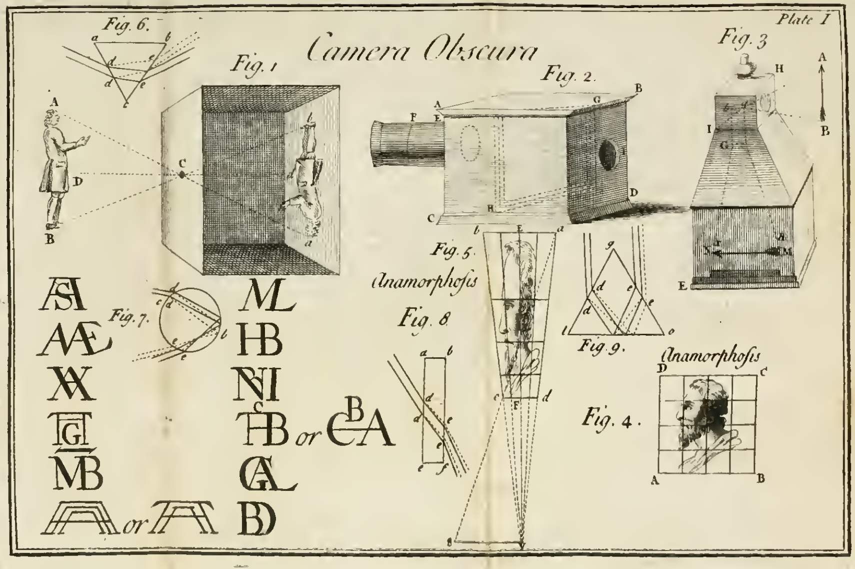


Plate I

Camera Obscura



An image alſo may be diſtorted mechanically; by perforating it here and there with a needle, and placing it againſt a candle or lamp; and obſerving where the rays which paſs through theſe little holes fall on a plane or curve ſuperficies; for they will give the correſpondent points of the image deform'd; by means of which, the deformation may be compleated. See the plate.

HENRY ANDERSON was a face painter, and a diſciple of *Streater* in great eſteem about the year 1660, which he did not long ſurvive; he drew the beautiful ducheſs of *Richmond*, which recommended him to draw king *Charles* II. and moſt of his court. He interfer'd in his buſineſs with Sir *Peter Lely*, and had great ſhare of reputation in thoſe times; he was likewiſe a landskip painter, and in ſtill life; as alſo a good imitator of his maſter *Serjeant Streater*, till he left his way and fell to face painting.

ANDREW ANDREANI of *Mantua*, he made uſe of the two marks on the plate No. 8, 9; he engrav'd on wood *a tre tagli* or the croſſings in his ſhades, the ſecond mark is found in the croſſings of *Julius Cæſar*, in ten ſheets engrav'd in 1699, and was invented by *Andrew Mantegna*, who alſo engrav'd on copper.

ANEMONIES [the way of painting them in miniature] of this flower there are many ſorts as well double as ſingle, which laſt are commonly plain, and are either purple with purple and white, ſhaded with the ſame colour, ſome bluer ſome redder, ſometimes very pale, and ſometimes very deep.

Others are coloured with *lake* and *white*, and finiſh'd with the ſame, by diminiſhing the white or even uſing none at all.

Others again are coloured with *vermilion*, and ſhaded with the ſame colour, and deepened with *carmine*.

Others are white and lemon colour. Theſe laſt are done with maſticote, and both the one and the other muſt be ſhaded and finiſh'd, ſometimes with *vermilion*, and ſometimes with a very deep *lake*, eſpecially at the bottom of the cup about the ſeed, which is alſo often of a *blackiſh* colour, which is imitated with *indigo* or with *black* and *blue*, mingling in ſome a little *biſtre*, and working continually with fine ſtrokes, and ſcumbling the ſhades into the lights.

There are ſome, that have the bottom of the cup much brighter than the reſt, and even ſo as to be quite white altho' the reſt of the Anemony be deep.

The ſeed of all theſe Anemonies is imitated with *indigo* and *black*, with a very little white; ſometimes it muſt be heightened with maſticote.

DOUBLE ANEMONIES are of very various colours; but the fineſt of them have their largeſt leaves ſtrip'd.

Some of theſe ſtripes are perform'd with *vermilion*, to which is added *carmine* to finiſh them, ſhading the reſt of the leaves with *indigo.*

For the ſmaller leaves within lay on a mixture of *vermilion* and *white*, and ſhade with *vermilion* mix'd with *carmine*, and here and there be very ſtrong, particularly in the heart or cabbage, near the great leaves on the ſhady ſide, and finiſh with hair ſtrokes of *carmine*, which muſt humour the ſtripes and turn of the leaves.

The ſtripes of others are coloured and finiſh'd with *carmine* only, as well as the inner or ſmaller leaves; but yet obſerving to leave a little round in the midſt of theſe laſt, where a deep *purple* or *violet* muſt be laid, which muſt be ſcumbled into the reſt; and the whole being finiſh'd, lay on broad ſtrokes of this ſame colour around the ſmaller leaves, eſpecially on the dark ſide, and ſcumble them into the greater, which muſt for the reſt be ſhaded with *indigo* and *black.*

In ſome others, the ſmaller leaves are of *lake* or *purple*, although the ſtripes of the greater are *carmine.*

There are others whoſe ſtripes are *carmine* in the middle of moſt of the large leaves, with *vermilion* under it in ſome places, all which muſt be ſcumbled into the ſhades of the ground, which are of *indigo* and *white.*

The ſmaller leaves are laid in with *maſticote*, and are ſhaded with a very deep *carmine* on the light ſide, leaving here the *maſticote* almoſt to itſelf, and only dividing the leaves with a fine touching of *orpiment* and *carmine*, which ſmaller leaves may be ſometimes ſhaded with a very little pale green.

There are *double Anemonies* all *red*, and of a violet colour; the firſt are coloured with *vermilion* and *carmine*, with ſcarce any white, and are ſhaded with *carmine* alone, well gummed, that they may be very deep; *purple Anemonies* are imitated with *purple* and *white*, and are finiſh'd without *white.*

In ſhort, there are of all colours of theſe *double Anemonies*, as well as of the *ſingle*, which are to be painted by the rules here ſuggeſted.

The *green* of both the one and the other muſt be *verditer*, mixt with *maſticote* for the dead colouring, and it muſt be finiſh'd with bladder *green.*

Their *ſtalks* incline to be a little reddiſh; therefore they are to be ſhaded with *carmine*, and ſometimes with *green* after they are laid in with *maſticote.*

FILIPPO ANGELI call'd NAPOLITANI, imitated *Michael Angelo Caravaggio*, liv'd at *Rome*, *Naples* and *Venice*, excell'd in battles and landſcapes, died in the year 1609 aged forty years.

Philippo d' ANGELO, a *Roman* born in the year 1570. He practiſed for the moſt part in battles and landſcapes, died at *Venice* Anno Ætat. 40.

Michael ANGELO PACE, born 1610, and call'd *Campidoglio*, was a diſciple of *Fioravanti*, and very much eſteem'd all over *Italy*, for his admirable talent in painting fruit and ſtill life. He died at *Rome* anno 1670, leaving behind him two ſons, of whom *Gio Battiſta* was brought up to hiſtory painting under *Franceſco Mola.*

MICHAEL ANGELO BUANOROTI of noble deſcent, born in the year 1474, ſcholar of *Dominico Ghirlandaio*, liv'd at *Florence* and *Rome*, excell'd in hiſtory painting, ſculpture and architecture, died in the year 1564, aged ninety years.

MICHAEL ANGELO CERQUOZZI call'd DALLE BATTAGLIE, born in 1600, ſcholar of *Antonio Salvatti* a *Bologneſe*, liv'd at *Rome*, excellent for battles and fruit, died in the year 1660, aged ſixty years.

The paſſion of ADMIRATION ſays M. *Le Brun*, is a ſurprize which makes the mind conſider with attention, thoſe objects which ſeem rare or extraordinary.

It is obſerv'd, that admiration cauſes no change in the heart nor in the blood, as the other paſſions do; the reaſon of which is, that having neither good nor ill for its object, but only to know the thing one admires, it has no relation to the heart or blood, on which depends all the welfare of the body.

Admiration is the firſt and moſt temperate of all the paſſions, wherein the heart feels the leaſt diſturbance; and therefore the face receives little alteration thereby; and if any, it will only be the raiſing of the eye-brows; the ends thereof being yet parallel; the eye will be a little more open than ordinary, the ball and even the lids without motion being fix'd on the object, which cauſes the admiration.

The mouth will be open; but will appear without alteration, any more than the other part of the face.

This paſſion produces only a ſuſpenſion of motion, to give time to deliberate what ſhe has to do, and to conſider attentively the object before her; if that be rare and extraordinary, out of this firſt and ſimple motion of admiration is engendred *eſteem*. How this paſſion is repreſented in drawing. See the plate at the end of letter A.

ANGER ſays M. *Le Brun*, is a turbulent agitation excited in the appetite by grief and boldneſs; by which the ſoul is retir'd into itſelf, to avoid the injury receiv'd, and at the ſame time is rais'd againſt the cauſe of the injury, to be reveng'd of it.

When anger ſiezes on the ſoul, he who feels this paſſion, hath his eyes red and inflamed; his eye-balls wandring and ſparkling; his eye-brows ſometimes drawn down, and ſometimes rais'd up one againſt another; the forehead, will appear deeply furrowed; and with wrinkles between the eyes; the noſtrils will appear opened and widened; the lips preſs'd one againſt the other; and the under lip ſurmounting the upper, leaving the corners of the mouth a little open, forming a kind of cruel and diſdainful grin.

He will ſeem to grind his teeth and to foam at the mouth, his face will be in ſome places pale, and in others red and ſwell'd; the veins of the forehead the temples and the neck, will be ſtrained and puffed up, the hair ſtanding upright; and he who is poſſeſs'd with this paſſion, is ſwell'd and puffed up by a ſtoppage of the breath; the heart being oppreſs'd by a great quantity of blood, which retires thither, as it were to its ſuccour.

In anger, all the motions are very great and violent, and all the parts agitated; the muſcles muſt be very apparent, bigger and more ſwell'd then ordinary, and the veins and nerves ſtrained.

How anger is repreſented in drawing and painting, ſee the figures in the plate at the end of letter A.

To *anger* ſometimes ſucceed rage and deſpair.

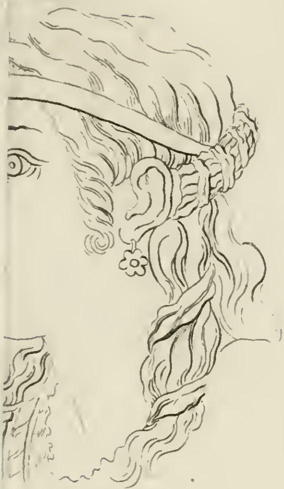
ANGER is repreſented in painting by a young man, round ſhoulder'd, his face bloated, ſparkling eyes, a round brow, a ſharp noſe, wide noſtrils; he is clad all in red, his creſt is a boar's head; from which iſſues fire and ſmoke; he holds in one hand a drawn ſword; and in the other a lighted torch.

He is repreſented young; becauſe youth is prone to *Anger*. The boar is an animal much inclin'd to wrath; the ſword ſhews, that *Anger* preſently lays *hold* of it; the cheeks pufft and bloated intimate, that *Anger* often *alters* the face, by the boiling of the blood; and *inflames* the eyes.

GUM

Plate II.

iration.



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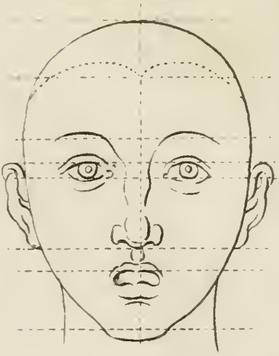
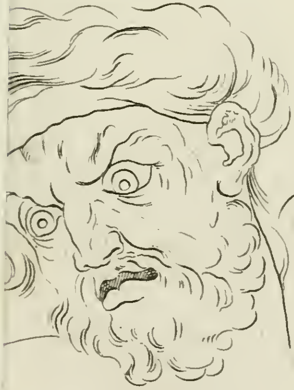


Anger.



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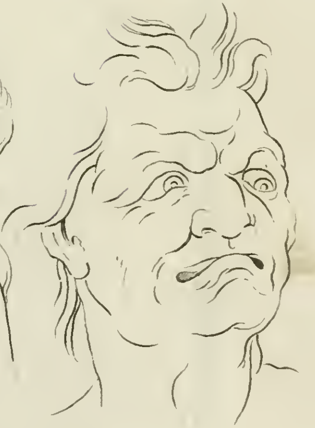

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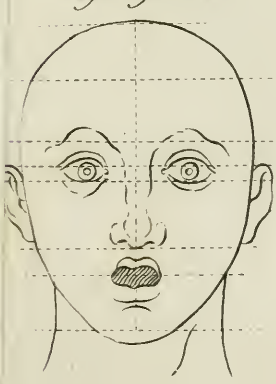

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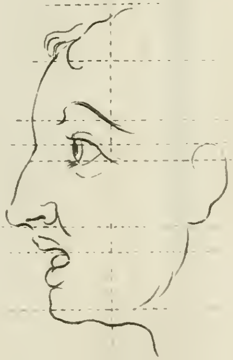

Plate II.

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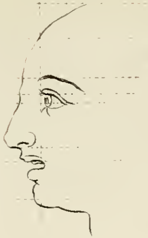

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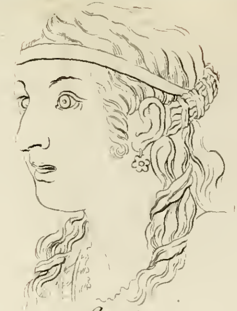

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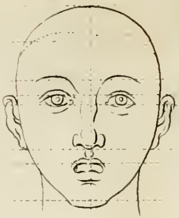
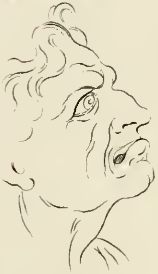


Anger



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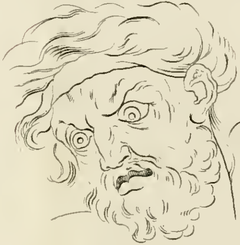

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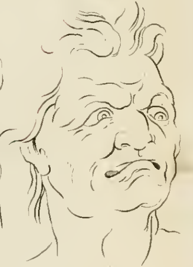
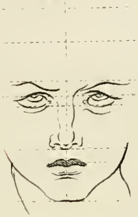
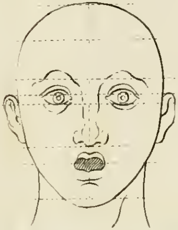


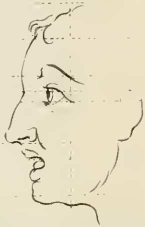
Attention.



Aſtoniſhment.



Aſtoniſhment



GUM ANIMÆ, GUM ANIMI, a kind of gum or roſin, of which there are two ſorts, the oriental and occidental. The *oriental Gum Animæ*, is diſtinguiſhed into three ſorts; the firſt is white, the ſecond blackiſh; in ſome reſpects like myrrh; the third pale, reſinous and dry.

The *occidental* flows from an inciſion in a tree growing in *New-Spain*, call'd there *Courbati*; it is tranſparent, and of a colour like to that of frankincenſe. Its ſmell is very agreeable, and it eaſily conſumes in the fire: all the ſeveral kinds are us'd in perfumes by reaſon of their charming ſmell; but *bdellium* is frequently ſold inſtead of it.

ANNEALING, commonly call'd *Nealing*, is a term us'd for the preparing of ſeveral matters, by heating or baking them in an oven or the like.

Annealing of glaſs, is the baking of it, to dry, harden and give it the due conſiſtence, after it has been blown and faſhion'd into the proper works.

This is uſually perform'd in a kind of tower, call'd the *Leer*, built over the melting furnace *Annealing* or *Nealing* of glaſs, is commonly us'd for the ſtaining of glaſs with metal colours.

Annealing of ſteel, is the heating it in the fire to a blood red heat; and then taking it out, and letting it cool gently of itſelf.

This is done to make it ſofter, in order to engrave or punch upon it.

ANTICKS ANTIQUES (of *Antes*, L.) are buttreſſes, &c. the form of them (is only for delight's ſake) a general or irregular compoſition of men, beaſts, birds, fiſhes, flowers and ſuch like, without either rule or reaſon; this muſt be a continuation of one and the ſame work, through the whole piece without change or alteration.

As if it be naked boys playing, lying, ſitting or riding upon goats, eagles, dolphins and the like; ſtrings of pearls, ſatyrs, tritons, apes, dogs, oxen, bearing or drawing fruits, branches or any wild fancy after your own invention, with a thouſand ſuch other idle toys; be ſure you obſerve the continuation.

ANTIQUE, ancient, the term is chiefly us'd by ſculptors, painters and architects, who apply it to ſuch pieces of ſculpture, painting and architecture, &c. as were made at the time, when the arts were in their greateſt perfection, among the ancient *Greeks* and *Romans*, viz. from the age of *Alexander the Great*, to the time of the Emperor *Phocas*, when *Italy* became over-run by the *Goths* and *Vandals*. In this ſenſe the word, is the contrary of modern. Thus we ſay, the *Antique manner*, the *Antique taſte*, an *Antique buſt*, &c.

ANTIQUE, is ſometimes even contradiſtinguiſh'd from ancient, which denotes a leſſer degree of *antiquity*, when the art was not in its utmoſt purity.

ANTIMONY, is a mineral ſubſtance of a metalline nature; having all the ſeeming characters of a real metal, except malleability.

It is properly call'd a *ſemi-metal*; it being a foſſile glebe compos'd of ſome undetermin'd metal, combin'd with a ſulphureous and ſtony ſubſtance.

Antimony, is found in mines of all metals; but chiefly in thoſe of *ſilver* and *lead*; but that found in *gold* mines, is uſually eſteem'd the beſt. There are alſo particular mines of it, as thoſe in *Hungary*, *Tranſylvania*, *Germany*, and in ſeveral provinces of *France*.

It is found in clods or ſtones of ſeveral ſizes, bearing a near reſemblance to *black lead*; except that it is lighter and harder: and thence it is call'd *marcaſite of lead*; and its metalline part is ſuppos'd to be of that ſpecies.

Antimony, has ſomething particular in its texture, being full of little ſhining veins or threads, like needles, brittle as glaſs. Sometimes it has veins of a red or golden colour intermix'd, which is call'd *Male-Antimony*; as that which has not theſe ſpecks is call'd *Female*.

It will fuſe in the fire, though not without ſome difficulty, and diſſolves more eaſily in water.

After it has been dug out of the earth, it is put into large crucibles, and fus'd with a violent fire; and afterwards poured into cones or antimonial horns; which is the common or crude *Antimony* of the ſhops; the *apex* of which is always the beſt and pureſt part; as the baſis or broadeſt part is the fouleſt.

The uſes of *Antimony* are numerous and important. It is mingled with *tin* to make it white and harder; and with *bell metal* to render the ſound more clear; and is a common ingredient in ſpecula or burning concaves, ſerving to give them a finer poliſh. It is a general aſſiſtant in melting of metals.

A. P. M. A. ſignifies *Abas Primaticcius, inv. Marc Anthony, exc.* this mark is found in a plate repreſenting a ſhepherd lying under a tree; and another holding his hand on an univerſal planiſphere.

APPARENT Magnitude of an object, is the Magnitude thereof, ſuch as it appears to the eye.

The *Apparent* or ſeeming Magnitude, is meaſur'd by the optic angle.

The *Apparent or ſeeming Magnitude* of an object, is ſaid to be ſo many degrees as the optic or viſual angle ſubtends.

The *Apparent* Magnitudes of diſtant objects, are uſually ſaid to be as their diſtances, reciprocally.

The APPARENT *Place* of any object in *opticks*, is that wherein it appears, when ſeen through one or more glaſſes; the *Apparent Place*, is different from the real one; for when by refraction through glaſſes, that parcel of rays which falls on the pupil of the eye, from each point of any near object, is made to flow as cloſe together as that which comes from a diſtant one; or when by the ſame means, the rays coming from diſtant objects are made to diverge as much as if they flow'd from near ones; then the eye muſt neceſſarily ſee the place of the object chang'd, which change is its *Apparent Place*.

If an object be plac'd nearer to a convex glaſs, than is the diſtance of its focus: its *Apparent Place* may be determin'd; but if the object be in the focus of the glaſs, the *Apparent Place* of the object cannot be determin'd, only that it will appear vaſtly remote.

Nor can the *Apparent Place* be determin'd, if the object be beyond the focus of a convex glaſs; but if the object be further diſtant from a convex glaſs than its focus, and the eye lie beyond the diſtinct baſe; its *Apparent Place* will be in the diſtinct baſe.

APPEARANCE, [in *perſpective*] is the repreſentation or projection of a figure, body or the like object upon the perſpective plane.

The *Appearance* of an objective right line, is always a right line.

Direct APPEARANCE, [in opticks] is the view or ſight of an object by direct rays; without either refraction or reflection.

APELLES, *Pliny* ſpeaking of the growth and perfection of the art of PAINTING, referring particularly to *Apelles*, tells us, as a preliminary to this account, that he ſurpaſs'd all that ever went before him, or came after him; *& nemo poſtea inventus eſt qui artem ultra provexerit.*

He was born in the 112 *Olympiad*, after the building of *Rome* 420 years, and 324 before *Chriſt*.

Strabo, ſays he, was born in *Epheſus*, where he put himſelf apprentice to *Pamphilus*.

APOLLO, is repreſented as a young man, without a beard, and rays of light about his head, having in one hand a harp, and the three graces, and in the other a ſhield and arrows..

He is alſo repreſented with long curl'd hair, crown'd with laurel in a purple robe, holding a ſilver bow in his hand, and plac'd on a throne of emeralds.

He was one of the moſt genteel of the Heathen Gods, of whom they do not relate ſuch filthy ſtories, as of the others. They made him the God of wiſdom, phyſick, muſick and learning.

APPREHENSION, is repreſented in painting by a young lady of a middle ſtature, cloth'd all in white; briſk and active, diſpos'd to liſten to another ſpeaking; having in one hand a cameleon, and in the other a mirrour.

Her youth denotes her *aptneſs* to apprehend and learn; the ſame is intimated by her middle ſtature: for the upper rooms are always worſt furniſh'd, is uſual ſpoken of a very tall perſon. Her white clothing, is becauſe white is the *ground* of all colours; ſhe being on tiptoe, ſhews her being in readineſs to learn and underſtand; the glaſs intimates, that ſhe imprints things on herſelf, and makes all ſhe *hears* and *ſees* her own.

APRIL, is repreſented like a young man in green, adorn'd with a garland of myrtle, and hawthorn buds; wing'd, holding in one hand primroſes and violets, and in the other the zodiack ſign taurus.

AQUA FORTIS, is a corroſive liquor, us'd as a menſtruum for diſſolving ſilver and all other metals, except gold.

Aqua Fortis, is one of the ingredients in *ſalt-petre*, which is the only ſalt that will act on ſilver.

In preparing *Aqua Fortis*, either *ſand* or *allum* or *vitriol* is mix'd, or the the two laſt together with *ſalt-petre*, and then diſtill'd by a violent fire, and the fumes being caught, condenſing in the receiver, become the *Aqua Fortis*.

If ſome of theſe matters are not added to the *nitre*, it will run too readily, and ſo prevent the evaporation; but the fuſion being prevented, the parts of the ſalt receiving more violent impreſſions from the fire, are converted into a volatile ſpirit.

Hence to try whether or no, *Aqua Fortis* be pure; put a grain of a ſolution of *ſilver* in *Aqua Fortis* into a like quantity of the water, and if the ſolution remains without either the water's turning milky, or the ſilver precipitating, the *Aqua Fortis* is pure.

Dyers uſe it in dying ſcarlet, *&c.* refiners for parting or ſeparating ſilver from gold or copper.

Alſo for colouring of bone, ivory, *&c.* which is done by ſteeping the things therein; after they have been firſt ting'd with *copperas* or *verdegreaſe.*

Some alſo turn it into *aqua regia*, by diſſolving in it a fourth part of its weight of *ſal armoniac*, and then ſtain therewith ivory hafts and bones of a fine purple colour.

Book-binders alſo throw it on leather, and ſo marble the covers of books.

Diamond cutters alſo uſe it to ſeparate diamonds from metalline powders.

It is alſo us'd in etching on copper or braſs plates.

Mr. *Boyle* tells us, he has caus'd canes to be ſtain'd like tortoiſe ſhell, by laying on them a mixture of it with oil of *vitriol* ſeveral times, over live coals, to cauſe it to penetrate the deeper, and afterwards giving them a gloſs with a little ſoft wax and a dry cloth.

Aqua Fortis, this liquor is of various and extenſive uſe to the workers in moſaic, for ſtaining and colouring their woods.

AQUA FORTIS, take diſtill'd white wine vinegar three pints, *ſal armoniac*, and *bay ſalt*, of each ſix ounces; *verdegreaſe* four ounces; put all together into a large well glaz'd earthen pot (that they may not boil over) cover the pot cloſe and ſet it over a quick fire; and cauſe it ſpeedily to boil two or three great waulms and no more: then uncover the pot, and ſtir it ſometimes with a ſtick, taking heed that it boil not over; having boil'd, take it from the fire, and let it cool, being cloſe cover'd; and when it is cold, put it into a glaſs bottle with a glaſs ſtopple. If this ſhould be too ſtrong in etching, weaken it with a glaſs or two of the ſame vinegar of which you made it; the common *Aqua Fortis* is exhibited in the *Pharmacopea Londinenſis*; and *Doron Medicum*, thus;

Take dry'd *vitriol* two pound, *ſalt-petre* one pound, mix them *and diſtil by a retort, in open* fire by degrees.

AQUA FORTIS which will diſſolve ſilver and quick-ſilver; there are ſeveral ſorts of *Aqua Fortis*, prepared after different manners, appropriated to the different uſes they are deſign'd for; but all of them always with *ſalt-petre* or *nitre*, which is the principal ingredient in *Aqua Fortis.*

This which follows, is one of thoſe that has a peculiar compoſition.

Take one pound of *nitre* or *ſalt-petre* refin'd, three pound of *roch allum*, calcin'd on the fire-ſhovel; and four ounces of *cryſtalline arſenick*; reduce all into a fine powder, to which add ſeven ounces of fine ſand (but *Neri* ſays *lime)* and having well mixt the whole compoſition, put it into a glaſs cucurbit, always leaving $\frac{1}{3}$ part of it empty; $\frac{2}{3}$ being fill'd, lute the cucurbit well with a ſtrong lute, which is to be made as follows.

Take one part of loam (a fat earth) which is found in rivers, three parts of ſand, of common wood aſhes well ſifted, of the ſhearings of woollen cloth, each half a pound, mix the whole well together, and putting water to them, make a ſoft paſte; to which add one third part of common ſalt powder'd, and work them all well together, and then uſe them in luting your veſſels.

But before you put the cucurbit or body on, you muſt lay ſand four inches deep, and thick iron bars to bear the weight, then fit a head, and lute the joints well with a lute made of fine flour, and lime powder'd and mixt with whites of eggs: then put on the joints, rollers of fine linen, then lute it again, and put on linen rollers again three or four times, each time letting it dry before you put on the next roller, and then this will bear the violence of the fire, and the penetrating force of the ſpirits of the *Aqua Fortis*.

After that, you muſt put this body of the *alembick* in a deep earthen pan, made of the ſame earth as *crucibles*, fill'd with ſand, ſo that it be buried in the ſand, within two inches of the joints; then ſet it in a wind furnace fit and capable to maintain an equal fire. See the article FURNACE.

Your *alembick* being thus fitted, you muſt put to the head a glaſs receiver very capacious, the better to reſiſt the force of the ſpirits, otherwiſe all may break.

Lute it well to the mouth of the *alembick*, as you did the joints before, and with the ſame precaution of letting it dry each time in the air, taking care not to kindle the fire in the furnace, till the lute of all the joints be dry; for that is very neceſſary.

The whole being thus in right order, kindle a ſmall-coal fire for the ſpace of three hours, during which time, the windy humour, that is in the materials, and which would break them, will be drawn off into the receiver.

So continue a moderate fire for ſix hours, then increaſe it little by little, putting in at laſt billets of dry oaken wood to the coals for ſix hours more, till the *alembick* or head begin to be ting'd yellow, and the ſpirits begin to riſe.

Obſerve to continue this regimen or degree of fire, till the head and receiver begin to grow red; then augment it till the *alembick* becomes of a deep red; continue this degree of the fire, as long as that colour laſts, till all the ſpirits are drawn off, and the head and receiver begin by degrees to grow clear, and re-aſſume their common colour in cooling; which ſometimes will be two days firſt.

Notwithſtanding you muſt continue the fire two days afterwards, then let the furnace cool of itſelf; taking care, that while the *alembick* and receiver are ſtill red and the fire in force, that you admit no cool air into the place, and that nothing cold touch them, which would break them.

When all is cold, cover the head and receiver with wet linen, (that the ſpirits which are about the head and receiver) may the better ſink to the bottom of the receiver, and let it ſtand ſo for twelve hours.

Then bathe the joints, and the luting with warm water in order the better to looſen the bandage, and ſo take off the head from the receiver, otherwiſe it would be difficult to do it; then you may break the body which will be good for nothing, and take out the *fæces*, which reduce again to powder.

Add to each pound of that powder four ounces of refin'd *nitre*, and put the whole into a cucurbit (or body) on which pour all the *Aqua Fortis*, before diſtill'd; then put on the head and receiver, and lute it and dry it well as you did before, having put it on the ſame ſand furnace; during the firſt four hours make a gentle fire, which afterwards may be increas'd by little and little, till the head and receiver begin to grow clear, and all the ſpirit is drawn over.

After which let all cool, covering the head and receiver with wet cloths, and let it ſtand twelve hours as before. Then unlute the joints again with warm water, and put the *Aqua Fortis* into glaſs veſſels well ſtopt, that the ſpirits may not exhale, and keep it for the uſes hereafter mention'd.

This is the *Aqua Fortis* call'd water of ſeparation, and the beſt that can be made.

There are ſome, who inſtead of *roche allum* take the beſt *Roman vitriol* or the like.

You may know whether the *vitriol* be proper for this uſe or not, by rubbing it on a piece of well poliſh'd iron, if it be, it will leave a copper colour on it, then this *vitriol* will make an *Aqua Fortis* far more penetrating than the former. See the purification of this *vitriol* under the article VITRIOL.

AQUA MARINA, a gem or precious ſtone of a ſea green colour. It is found along the coaſts, and is ſaid to vie with the *amethyſt* in hardneſs.

Some criticks have contended for its being the ſixth ſtone in the rationale of the *Jewiſh* high Prieſt; call'd in the *Hebrew*, *tharſis*, which has been render'd in the *Latin*, *berillus*, and by others *chryſolithus*; ſeveral lapidaries take it for the *beril*.

AQUA MERCURII, *to make.* Take putty or tin calcin'd very fine and pure, one ounce, quickſilver purified, two ounces, mix them and make an amalgama: waſh this with fair water till it comes off clear and colourleſs; then dry it perfectly, put it into a matraſs, with ſuch a degree of heat as is neceſſary for ſublimation: when it has been ſublim'd and is grown cold, take out the ſublimate; to which add an ounce of *Venetian* corroſive ſublimate; grind them well together on a porphyry, then put them into another matraſs, cloſe it very well, and ſink it all over in a veſſel of water, ſo in a ſhort time the whole maſs will be reſolv'd into water: filter this into a glaſs receiver, and coagulate on a gentle ſand heat to a cryſtalline ſubſtance; reduce this in a mortar to a very fine powder, and ſearce it through a fine ſieve, put it into a matraſs, ſtop it well, and digeſt in *balneo mariæ*, to be reſolv'd into water, which keep for uſe, in making artificial pearls, *&c.*

AQUA REGALIS, } is nothing but a common *aqua for-*
AQUA REGIA, } *tis*, wherein one fourth of its weight of *ſal-armoniac* has been diſſolv'd.

But in order to have a good and ſtrong *Aqua Regalis*, you muſt take one pound of *aqua fortis*, prepar'd as directed, and put it into a glaſs matraſs; and add to it only two ounces of *ſal-armoniac*, then ſet the matraſs into a warm bath, or pan of warm water, and ſtir it often, that the *ſal-armoniac* may be well diſſolved in the *aqua fortis*; which will be ting'd of a yellow colour.

Then you muſt add as much *ſal-armoniac* to it, as the *aqua fortis* can diſſolve, then let it ſettle a little; and the *ſal-armoniac* will leave at the bottom all its terreſtreity or earthy part.

After that decant it gently off into another veſſel, ſo as not to diſturb the ſettling at the bottom, or rather filtre it through whited brown paper.

This water will diſſolve gold and other metals, far better than the common *Aqua Regalis*, except ſilver, which it toucheth not at all, for reaſons, which chymiſts are acquainted with.

AQUA REGALIS, } far ſtronger than the former. This
AQUA REGIA, } is what ſome philoſophers call the water of the two champions, and is made with two parts of purified *ſulfur*, two parts of purified *ſal-armoniac*, and one part of calcin'd flints, all reduc'd to powder and mixt together.

Then take an earthen retort, which muſt have a little hole on the back (or curvature) on the upper ſide, through which you may put in the ingredients.

For the greater ſafety, you may lute the body of the retort over well, and let it dry; then put it in the furnace, and fit to it a large glaſs recipient (by reaſon of the violence of the ſpirits) wherein you may put a little water to attract them; lute the joints of them as you do for *aqua fortis*, and let them be well dry'd before you kindle the fire, for the reaſons elſewhere aſſign'd.

The lute being dry, and all in right order, you muſt begin with a gentle fire, that the retort may grow warm by degrees, and afterwards gradually increaſe it, till it grow red hot.

Then put in at the hole of the retort, four ounces at a time of the ingredients you have prepar'd, and ſtop it again preſently.

Doing thus, you will ſee in a little time great quantities of cloudy vapours ariſe, and paſs into the receiver and fill it, which will diſſolve by little and little; mixing themſelves with the common water, and the receiver will grow clear.

As ſoon as you perceive this, you muſt put four ounces more of your ingredients into the retort, and give time for the vapours (ariſing again) to diſſolve as before; then reiterate this proceſs, till all your ingredients are diſtill'd off.

Then unlute the receiver, and pour the liquor into an *alembick*, and draw off the phlegm in *balneo mariæ*, and rectify it in an aſh-fire; then the water will be made, and fit to diſſolve any metal but ſilver.

AQUA REGALIS, made another way more eaſily, and with leſs precaution.

Take one pound of good *ſalt-petre*, reduce it to powder, and mix it with three pound of potters clay, or flints calcin'd to powder; put the whole into a glaſs retort well luted, and fit to it a receiver, lute the joints well, then put it in a reverberatory furnace, and diſtil it acccording to art in a gradual fire.

When all the red ſpirits are paſs'd over, as we have explain'd in ſpeaking of *aqua fortis*. Then draw off the phlegm in *balneo mariæ*, then rectify it in an aſh furnace, and keep it for uſe.

Then take a pound of *ſal-armoniac* well powder'd, and mix it with four pounds of wood aſhes (out of which you have before extracted all the ſalt with warm water) then put the whole into a retort, fit a receiver to it, and diſtil it in a ſand furnace, and the ſpirit of *ſal-armoniac* will paſs over into the receiver.

Then unlute the receiver, and take off that phlegm of the ſpirit in *balneo mariæ*, and rectify it in aſhes.

Having done this, take of each of theſe ſpirits, and then mix them together, and diſtill them in an aſh furnace; then will you have a ſtrong menſtruum for diſſolving gold.

It is to be noted, that the ſpirit of ſea water ſalt, diſtill'd as *ſalt-petre*, has the ſame effects as the water of the two *champions*, the preparation of which has been given before, and as that which has been now treated of; and beſides it is not ſo ſharp or corroſive.

You muſt, if you would make it ſucceſsfully, take three parts of ſpirits of ſea water ſalt, and add to it one part of *ſalt-petre*, then diſtil it together in an aſh furnace, the better to unite them.

Then will you have an *Aqua Regalis*, which will diſſolve gold ſooner than the ſpirit of *ſal-armoniac*, and which will make it riſe and paſs over in the receiver.

Gum ARABICK, is the name of a gum which diſtils from a ſpecies of *Acacia*, growing in *Arabia* and *Egypt*.

It is very common among us, but little is to be met with that is genuine; it is ſuſpected to be adulterated with our common plumb-tree gums.

That is accounted the beſt, which is in ſmalleſt pieces, and almoſt of a white colour.

ARCHITECTURE, is repreſented in painting and ſculpture, by a woman ſitting upon a piece of a pillar, having all ſorts of tools and inſtruments about her, looking earneſtly upon a draught or deſign which lies in her lap; behind her a perſon repreſenting reaſon, looking likewiſe upon the draught, on her head a helmet, in her left hand *Pallas*'s ſhield, and in her right hand *Mercury*'s caduceus.

ARCHITECTURE *Military*, is repreſented in painting, &c. as a woman of ripe years, in a noble garment of divers colours, a gold chain about her neck, with a diamond in one hand, the mariners compaſs in the other, the deſcription of an hexagon fortification, a ſwallow on her fiſt, a pick-ax and ſpade at her feet. Her party-colour'd veſtments denote the underſtanding of divers contrivances in this art; the golden chain and diamond denote durability and excellency; for fortifications are the beſt jewels of princes, ſecuring them from enemies; the ſwallow is remarkable for the artificial building her neſt.

ARDICES the *Corinthian*, and TELEPHANES of *Sicyon*, or CRATO of the ſame city were the perſons, who made the firſt ſteps towards the advancement of *Painting*.

Theſe began to add other lines (by way of ſhadowing) to their figures, which gave them an appearance of roundneſs and much more ſtrength. This manner was call'd GRAPHICE, but the advantages it brought to its inventors were ſo inconſiderable, that they ſtill found it neceſſary to write under every individual peice, the name of whatever it was deſign'd to repreſent, leſt otherwiſe the ſpectators ſhould never be able of themſelves to make the diſcovery.

ARGENTUM MUSICUM, } a kind of liquid ſilver to
ARGENTUM MUSIVUM, } write with; take one ounce of tin, melt it, and put thereto *tartar* and *quickſilver* of each one ounce, ſtir them well together until they are cold, then pound them in a mortar, and grind it with a ſtone and muller; mix it with gum water, and you may write therewith, and afterwards poliſh it.

ARISTOCRACY, is repreſented in painting as a lady in the prime of her years, attir'd in a ſplendid habit, ſitting majeſtically in a chair of ſtate, a crown of gold on her head, holding in her right hand a bundle of rods bound together, and a garland of laurel, and in her left, a head piece; on her right ſide is a baſon and a purſe full of gold and precious jewels, and on her left hand an ax.

ARITHMETICK, is painted in cloth of gold or otherwiſe, as a lady in garments of different colours, beſprinkled with muſical notes, and in the skirts is written *par* and *impar*, even and odd, in her left hand the numeration table.

Her handſomneſs denotes the beauty of all things in number, weight and meaſure, her perfect age ſhews the perfection of this Art, the various colours ſhews, that ſhe gives principles to all parts of the mathematicks.

ARMENUS *Bolus*, i. e. Bole ARMONIAC or *ammoniac*, a kind of earth brought from *Armenia*. It is of a pale red colour, and partakes much of the nature of ſtone; but is ſoft, fat, friable, eaſily pulveriz'd, and ſticks to the tongue.

This *Bole* is eaſily falſified, and the merchants frequently ſell *Lemnian earth* inſtead of it.

Matthiolus, ſays it is found in gold, ſilver and copper mines.

ARMONIACK, } is a ſort of volatile ſalt, of which there
AMMONIACK, } are two kinds, ancient and modern.

The ancient *Sal Armoniack* call'd alſo *Sal Cyreniack*, deſcrib'd by *Pliny* and *Dioſcorides*, was a native ſalt, generated in the earth, or rather the ſands in thoſe large inns or caravanſera's, where the crowds of pilgrims, coming from all parts to the temple of *Jupiter Ammon*, were wont to lodge. The way of conveyance being in thoſe parts commonly by camels, and thoſe creatures, when in *Cyrene*, a province of *Egypt*, wherein that celebrated temple ſtood, urining in the ſtables, or, as ſome ſay, in the parch'd ſands: of this urine, which is remarkably ſtrong, ſublimed by the heat of the ſun, aroſe a kind of ſalt, ſometimes call'd *Ammoniack*, and ſometimes *Cyreniack* from the region.

This ſalt being no longer found in theſe parts, ſome authors ſuſpect there never was any ſuch thing; and that the ancient as well as the modern *Sal Armoniac* was factitious.

The reaſon that no more is produc'd in *Egypt*, is becauſe the pilgrimages to the idol of *Jupiter Ammon*, have long ſince been laid aſide.

The characters of *Sal Armoniack* are, that it cools water, turns *aqua fortis* into *aqua regia*, and conſequently diſſolves gold; that it ſublimes by a large fire and affords a pungent urinous ſavour.

The modern *Sal Armoniack* call'd alſo *Aqua Cæleſtis*, is held by ſome to be native, and to trickle out of the ground about mount *Veſuvius* and *Ætna*, &c. in form of a liquor, which when filtred and inſpiſſated, becomes *Sal Armoniack*.

But this is certain, that all the modern *Sal Armoniac* is compound and factitious.

The publick has been for a long time at a loſs, both as to the place from whence it comes, and how it was made, all that was known for certain, was, that it came from the *Levant*.

But *Sicard* the jeſuit, ſays, it is made in *Egypt* in a ſort of ovens, contriv'd for the purpoſe, the tops of which are perforated with ſeveral longitudinal clefts; and on theſe clefts are laid ſeveral long neck'd glaſs bottles, fill'd will ſoot, a little ſea ſalt and the urine of cattle, well ſtopp'd.

Theſe are cover'd up with a body of clay and brick, all but the necks, which lie open to the air; and then the fire being put into the oven, it is kept up for three days and three nights ſucceſſively.

The phlegm of the materials contain'd in the bottles, being thus exhal'd by the heat of the fire; and the acids and alkaline ſalts abounding therein, being thus brought together near the necks of the bottles, they coaleſce, harden and form a whiteiſh maſs, which is the *Sal Ammoniack.*

Our chymiſts have divers ways of preparing a *Sal Armoniack* in imitation of this; but this is to be obſerv'd, that all ſoot is not not fit for the purpoſe; but only that exhaling from a ſort of fuel made of dung.

The common way is by putting one part of common ſalt, to five of urine; to which ſome add half that quantity of ſoot, the whole being put in a veſſel, they raiſe from it by calcination a white friable farinaceous ſubſtance, which they call *Sal Armoniack.*

ARROGANCE, is painted in the perſon of a lady cloth'd in a green garment; with aſſes ears, holding under her left arm a peacock, and extending the right arm, points with her forefinger.

Arrogance, aſcribes to itſelf what is not its own, therefore, it has the ears of an aſs, for this vice proceeds from ſtupidity and ignorance; the peacock intimates the putting a value upon oneſelf, and deſpiſing others.

ARSENICK, is a ponderous mineral ſubſtance, extremely cauſtic or corroſive to the degree of a violent poiſon.

There are divers kinds of *Arſenick*, viz. yellow or native red, and cryſtalline.

Native *Arſenick*, is of a yellow or orange colour; whence it is alſo call'd *auripigmentum* or *orpiment.*

It is chiefly found in copper mines, in a kind of glebes or ſtones, of different ſizes and figures.

As to the colour, though it is always yellow, yet admits of divers ſhades and mixtures, as a golden yellow, reddiſh yellow, green yellow, *&c.*

It is found to contain a ſmall quantity of gold; but ſo little as not to quit the coſt of ſeparating. Of this are prepar'd two other ſorts of *Arſenick white* and *red.*

Red Arſenick call'd *Realgal*, is only the native yellow rubified by fire.

The *white* or *chryſtalline*, is drawn from the yellow by ſubliming it with a portion of ſea ſalt.

White and *yellow Arſenick*, are alſo procurable from *cobalt*, the method of which as practiſ'd in *Hungary*, is as follows.

The *cobalt* being reduc'd to powder, and the light ſandy part waſh'd off by a current of water, what remains is put into a furnace; the flame of which paſſing over the powder takes the arſenical part along with it in form of a ſmoke; which being receiv'd by a chimney, and carried thence into a cloſe brick channel, ſticks by the way to the ſides, and is ſcrap'd off in form of a whitiſh or yellowiſh powder. From what remains of the *cobalt*, they proceed to make ſmalt.

The ſmalleſt quantity of any of theſe *Arſenicks*, being mixt with any metal renders it friable, and abſolutely deſtroys its malleability.

Hence the refiners dread nothing ſo much as *Arſenick* in their metals; nor could any thing be ſo advantageous to them as a menſtruum, that would abſorb or act on *Arſenick* alone; for then their metals would be readily purified, without flying off or evaporating.

A ſingle grain of *Arſenick* will turn a pound of copper, into a beautiful ſeeming ſilver; this hint many perſons have endeavour'd to improve on, for making of ſilver, but in vain, becauſe it could never be brought to ſuſtain the hammer; and ſome have been hang'd for coining ſpecies of this ſpurious ſilver.

Of the colour of the beſt ASHES. The colour of the beſt *Aſhes* is a fine *blue* or *sky* colour. The manner of examining the colour is as follows, *viz.* by throwing a piece of very fine white cloth or crape over the *Aſhes*; and if the aſhes appear of a beautiful *blue* through the thin cloth, and the whiteneſs of the cloth plainly appears as ſpread over the *Aſhes*; it is a ſatisfactory proof that the *Aſhes* are the beſt and fineſt.

This ſort of *Aſhes* is us'd in the linen manufacture in *Brabant*, and by the thread bleachers; this is generally the ſcarceſt ſort, and bears the higheſt price, and is not only fit to give a luſtre to linen; but is proper for all other manufactures, could it be had in great plenty.

Of the bleachers ASHES *in* Holland. The diſtinction between theſe and the former is more cuſtomary than uſeful: the *Dutch* bleachers buying one inſtead of the other; and preferring the latter to the former; but though the latter are ſometimes in thinner barrels, and more glutinous than the former, yet in weight and ſtrength, they are not to be compar'd with them.

To dye cloth, &c. ASH *Colour*. To dye a picee of fifteen ells of cloth, *&c.* of an *Aſh Colour*, firſt dye it a sky colour with *woad* and *indigo*, then rinſe it out clean and dry it, then

apply

apply the following black; take four ounces of beaten galls, one dram of burnt *alum*, half a pound of vitriol; boil the dye and the ſtuff in it for half an hour, then paſs it through and rinſe it; then add to the ſuds three ounces of *braſile*, that has been before boil'd in a skillet in part, three quarts of ſharp lye, half an ounce of rock ſalt or *ſal Gemmæ*, and you will have a beautiful *Aſh Colour*.

You may alſo prepare this colour brighter with galls, but if the luſtre be not good, when taken out of the *woad* or *indigo* copper to try; then add four ounces of *ſumach*, ſix ounces of *vitriol*, three ounces of *madder*, three ounces of ſalt, half an ounce of burnt *alum*.

But the firſt *Aſh Colour* is the more beautiful and laſting.

Another method of dying ASH COLOURS. Take a ſufficient quantity of water, nut galls bruis'd ſmall eight ounces, madder two ounces, put all into the veſſel and let them boil; then enter twenty yards of broad cloth and handle it, letting it boil two hours; then cool it and put in copperas two ounces, and then enter the cloth again and handle it; then let it boil a quarter of an hour, and cool it. If you would have it ſadder, you muſt put in more copperas.

Note, That *handling* of it ſignifies to roll it on the roller, as it is boiling, and to let it all in again to hinder its ſpotting, and to make it take colour equally. *Cooling* it ſignifies to take it up and air it.

Another Aſh Colour. Take of nut galls bruis'd ſix ounces, red tartar bruis'd four ounces, let them boil well one hour and half in the liquor: then enter twenty yards of broad cloth, and handle it well, and cool it; after which put in two ounces of copperas, and ſadden it with copperas as you pleaſe.

To dye the beſt Aſh Colour. Take fair water a ſufficient quantity, red tartar four ounces, nut galls three ounces, bruiſe them ſmall and enter twenty yards of cloth, boil it an hour and half; then cool and ſadden it as you think fit.

Another way to dye an Aſh Colour. Take a ſufficient quantity of water, put it into the copper, put into it ſix ounces of nut galls bruis'd ſmall; let the copper boil and then enter your cloth; and let it boil an hour and half, and then cool the cloth, then put in four ounces of red tartar, which diſſolve: then put in the cloth again, and let it boil half an hour; then take it out, cool and air it: Laſtly, Put in half an ounce of copperas and let it melt, enter your cloth again, and ſadden it as you pleaſe. This will dye three pounds weight.

Another Aſh Colour. Take a ſufficient quantity of water, ſix ounces of galls bruis'd ſmall: put them into a caldron and let them boil, then enter the cloth for the ſpace of an hour and a half, then put in five ounces of red tartar (having firſt taken out the cloth) which diſſolve, and put in the cloth again, and boil it for half an hour, then take it out, cool and air it: Laſtly, Put in half an ounce of copperas, and as much white vitriol, diſſolve them, then enter your cloth again, and it will be a good colour to dye three or four pound weight.

Another kind of Aſh Colour. Take a ſufficient quantity of water, and add to it nut galls beaten ſmall four ounces, cochineal half an ounce; boil them together, and enter your cloth and let it boil an hour and a half, and then cool the cloth: then put in four ounces of copperas, and then enter the cloth again and ſadden it. This will dye twelve pounds of yarn or cloth.

EDMUND ASHFIELD, a gentleman well deſcended, who drew both in oil and crayons, he was diſciple to Mr. *Wright*, and painted ſome heads as big as the life; he firſt found out the way to multiply the number and variety of teints in *crayons*, and therewith to draw various complexions in imitation of oil painting; this he performed on paper, and practis'd ſeveral years with deſerv'd applauſe; he brought thoſe heads to ten pounds price a piece.

From him Mr. *Luttrell* had his inſtructions, who has improv'd that invention, and multiplied the variety of colours to effect any thing, as alſo found out a method unknown before to draw with thoſe chalks or crayons on copper plates, either by the life or hiſtorically.

ASIA, is repreſented in painting, *&c.* wearing a garland of various flowers and fruits, clad in a rich veſtment embroidered; holding in her right hand branches with roots of *caſſia*, pepper and cloves, and in her left hand a cenſer ſmoaking; and by her a camel on its knees.

The garland intimates, that *Aſia* produces delightful things neceſſary for human life; her garment the great plenty of thoſe rich materials; the bundle of ſpices, that ſhe diſtributes them to other parts of the world. The cenſer ſignifies the odoriferous gums and ſpices it produces; and the camel is a beaſt proper to *Aſia.*

MICHAEL L'ASNE, engrav'd the rudiments of deſigns and other plates, and us'd the mark. See the plate No. 10.

DOUBLE ASPECT [in painting] is us'd, where a ſingle figure is ſo contriv'd, as to repreſent two or more different objects, either by changing the poſition of the eye, or by means of angular glaſſes.

ASSIDUITY, is repreſented in painting as an ancient woman, holding in both her hands an hour glaſs, and on one ſide her is a rock, ſurrounded with a branch of ivy.

Her age denotes that time and labour are continually deſtroying us, and ſhe therefore holds an hour glaſs, which requires diligence in turning and often moving it, leſt it ſtop.

ASSISTANCE, is repreſented in painting, &c. by a man in years, clad in white, and over all a purple mantle; a ray ſhining round him, crown'd with a garland of olive; a chain about his neck, and a heart for a pendant; his right arm is extended, and his hand open; in his left hand he holds a ſtake ſurrounded with a vine, and at his right is a ſtork.

His age intimates his *diſcretion*, not being intent upon *avarice*, in giving his helping hand.

The white raiment indicates his *ſincerity*, without ſelf intereſt. The ſplendid ray denotes *divine aſſiſtance*, without which, as the wife without the husband, it is like the vine without the ſtake; the ſtork the natural affection of parents.

ART, is repreſented in painting by an agreeable woman, who ſeems to be ingenious by her very looks, ſhe is habited in a gown of green, holding in her right hand a hammer, an engraving tool and a pencil, and in her left hand a ſtake that ſupports a vine.

The agreeableneſs of her countenance declares the charming nature of Arts, attracting all eyes to it, and gaining the author's approbation and commendation; the three inſtruments are for imitating nature; the ſtake ſupplies nature's defects in holding up the tender plant.

ARTIFICE in painting, &c. is repreſented as a comely man in a richly embroidered garment, laying his hand upon a ſcrew of perpetual motion, and by his right he ſhews a hive of bees.

He is nobly cloth'd, becauſe Art is noble of itſelf, his hand upon the ſcrew ſhews, that engines have been contriv'd by induſtry, and by thoſe incredible things like the perpetual motion have been perform'd.

The hive intimates the induſtry of bees, which being inconſiderable, are nevertheleſs great as to their conduct.

ASTONISHMENT proceeds from an exceſs of admiration, which ſurprize is ſometimes ſo ſtrong, as to drive the ſpirits towards the place from whence the impreſſion of the object is receiv'd; and being ſo much employ'd in conſidering this impreſſion, that there remain no ſpirits to paſs through the muſcles; the body becomes immoveable as a ſtatue.

How this paſſion is repreſented in drawing and painting, ſee the figures of admiration and aſtoniſhment in the plate.

ASTRONOMY, is painted with a ſilver creſcent on her forehead, an azure mantle, a watchet ſcarf, beſprinkled with golden ſtars.

It is alſo repreſented as a lady in a ſtarry habit, her eyes looking towards heaven; holding in her right hand an aſtrolabe, and in her left a table of aſtronomical figures.

Her garments denote the night, the moſt proper to ſee the ſtars in; her eyes and thoughts always elevated and intent upon celeſtial bodies, the aſtrolabe meaſures the diſtance of them; the table ſhews the difference of it from aſtrology.

ATTITUDE of *Attitudo* Italian *q.* of *Aptitudo*, L. is in painting and ſculpture, the poſture of a figure or ſtatue, or the diſpoſition of its parts, by which we diſcover the action it is engag'd in, and the very ſentiment, ſuppos'd to be in the mind. See ACTION, FIGURE, STATUE.

The repreſenting theſe in a ſtrong and lively manner, makes what is call'd a *good Expreſſion.* See EXPRESSION.

AVARICE, is repreſented in painting by an old woman, pale fac'd, lean and melancholy, afflicted with a pain, which makes her lay one hand upon her belly; yet ſeems to devour a purſe with her eyes, which ſhe graſps in the other, accompanied with an hunger ſtarv'd wolf.

Her paleneſs proceeds from her *Envy*, that torments her to ſee her neighbours richer than herſelf; her eyes are fixt on her purſe, it being her chief delight; the wolf denotes the voracious appetite of the covetous, who would have other men's goods by hook or by crook.

AVERSION may be expreſs'd in drawing by the poſture of the body, thus; the body may be repreſented as retiring backwards; the hands as if they were puſhing off the object, which cauſes the *Averſion*, or elſe they may be drawn back, as alſo the feet and legs.

AUGURY. Good *Augury* is repreſented in painting, by a young man cloth'd all in green, having a ſtar over his head hugging a ſwan.

The green clothing is a token of *hope*, and conſequently of good luck, becauſe greenneſs promiſes a plentiful crop, the ſtar denotes good ſucceſs, and a perſon not to be (as we ſay) born under a three-penny planet; the whiteneſs of the ſwan is alſo an emblem of fortunateneſs; as a black crow is of bad luck.

AUGUST, is repreſented by a young man of a fierce countenance, clad in a robe of flame colour; crown'd with a garland of wheat ears; having on his arm a basket of ſummer fruits; at his belt a ſickle bearing a virgin.

AURORA, *i. e.* the morning is perſonated by poets and painters. *Homer* deſcribes her like a young virgin, having her hair diſhevell'd, and hanging loſe about her ſhoulders; being of the colour of the pureſt gold, ſitting in a golden chair, with all her veſtments of that hue and colour.

Virgil deſcribes her, as coming, at the very inſtant of ſable night's departure, with one of her hands full of roſes, gilliflowers and lilies, taken out of a basket which ſhe carries in her other hand, beſprinkling them on the marble pavement of the lower heaven, adorning the ſun with unſpeakable beauty.

She is alſo repreſented as a young virgin with carnation wings, and a yellow mantle, in her forehead a ſtar, and golden ſunbeams from the crown of her head, riding upon *Pegaſus*; with a phial of dew in one hand, and various flowers in the other, which ſhe ſcatters upon the earth.

She is alſo deſcrib'd, holding in one hand a flaming torch, and drawn in a gorgeous chariot, beſpangled with ſtars, by wing'd *Pegaſus*; which favour ſhe is feign'd to have obtain'd from *Jupiter*, by many importunate requeſts, preſently after the downfal of *Bellerophon*.

She is fabled to be the herald and meſſenger of *Phœbus*, and as receiving her being from the virtue of his beams; and is no other than that rubicund and vermilion bluſh of the heavens, which the ſun's firſt appearance works in the *orient*, and from thence deſcending beautifies our *hemiſphere*, with ſuch reſplendency.

She is alſo painted in a purple robe, and a blue mantle fring'd with ſilver.

AURUM MUSICUM, } a ſort of liquid gold for writing:
AURUM MUSIVUM, } Take fine cryſtal and orpiment of each one ounce, pound them ſeverally, till they are reduced to a very fine powder, then grind them together well with glair.

With this you may write either with pen or pencil, and the letter or draught will be of a good gold colour.

Another way of making the ſame. Take of the beſt *Engliſh* tin, an ounce, and of the beſt *Spaniſh* quickſilver the ſame quantity: make of them an *amalgama*, by putting the crude *mercury* to the melted *tin*, and ſtirring together; then reduce them by pounding into a fine powder, and mix them with flowers of *ſal armoniack*, and flowers of *ſulphur*, of each an ounce: calcine gently, till the *ſulphur* is conſum'd, and ſo will the *Aurum* [gold] ſtick to the upper cruſt or ſcoria.

This being finely powder'd, and ground with glair, will with pen or pencil give your figure or picture a golden colour. See 2d. Ed. *Pharm. Bat.*

AUTHORITY, is repreſented in painting like a grave matron ſitting in a chair of ſtate, richly cloth'd in a garment embroider'd with gold, holding in her right hand a ſword, and in her left a ſcepter, and by her ſide is a double trophy of books and arms.

Her age and gravity indicates *Authority*, as alſo do the throne on which ſhe is ſeated, and the ſplendid habit the pre-eminence perſons in *Authority* have over others; the ſword lifted up denotes ſovereign power, and the ſcepter is alſo an enſign of *Authority.*

AUTUMN, is repreſented in painting by a man at perfect age, cloth'd like the *vernal*, and likewiſe girded with a ſtarry girdle; holding in one hand a pair of ſcales, equally poiz'd, with a globe in each; in the other a bunch of divers fruits and grapes.

Moſt of theſe are explain'd in the *vernal*, they being the ſame. The age denotes the *perfection* of this ſeaſon, when fruits are ripe. The balance or *libra* is one of the twelve ſigns of the zodiack, which denote *Autumn.*

AZURE, a mineral colour, prepar'd from the *lapis Armenus Azure*, is very near of kin to *ultramarine*; being procur'd from the *Armenian* ſtone, much after the ſame manner as the other is from *lapis lazuli.* See p. 132.

To dye an AZURE *Colour.* Take *roche allum* and filings of braſs of each two ounces, fiſh-glue half an ounce, vinegar or fair water a pint, boil it to the conſumption of the half.

B.

B. ſtands for *John Sebald Beham. Abbot Primaticcio*, who in *France* was call'd of *Bologna*, alſo us'd the letter B for his mark. So alſo did *Il Bonaſoni*, and ſo alſo did *Domenico Beccafumi* interſecting it with a line.

B. B. ſignifies *Bartholomew Beham* of *Norimberg*, he engrav'd at *Rome* and in *Bologna* with *Mark Antonio Raimondi.* The ſame letters were alſo us'd by *Bartholow Biſcano* a *Genoeſe* painter, in ſuch plates as were of his own invention.

B. B. A. F. ſignifies *Baccio Bandinelli* a *Florentine* Architect.

I. BACCHUS. *Philoſtratus* tells us that *Bacchus* was form'd in the likeneſs of a young man without a beard, of a corpulent and groſs body, his face of an high colour and big; his head adorn'd with a garland of ivy leaves having on his temples two horns; and cloſe by his ſide a certain beaſt, call'd a *Leopard* or *Panther.*

This deſcription is taken from the nature of wine (of which according to the fiction of the poets, Bacchus *was the God) whoſe inventer and finder out was certainly* Noah, *as not only* Moſes, *but* Joſephus *and* Lactantius *affirm; whence he is by many ſuppos'd to be this God* Bacchus.

II. *Claudianus* relates that his image or ſtatue was made all naked; which indicated the nakedneſs of thoſe, who abuſe themſelves

ſelves with wine; by which means they reveal and open thoſe things which ought to be conceal'd and kept hid.

III. *Diodorus Siculus* relates, that *Bacchus* among the *Greeks*, was repreſented in two ſeveral forms; the one as a very aged man with a long beard, ſtiff and thick, the other of youthful years, of a pleaſant and amorous aſpect.

The firſt form intimates the effects of the intemperate uſe of wine, which wears nature, and brings old age along with it; the other ſhews, that it cheriſhes and revives the heart, if moderately us'd.

IV. *Macrobius* informs us, that *Bacchus* was ſometimes repreſented in the likeneſs of a young child; ſometimes of a youth, ſometimes of a man; and ſometimes in the likeneſs of decrepid old age.

By theſe were ſignified the four ſeaſons of the year, the vine being dedicated to Sol, *in whom they all exiſt.*

V. *Philoſtratus* likewiſe tells us, that *Bacchus* was oftentimes drawn cloth'd in women's garments, and in a long purple robe; his head adorn'd with a coronet of roſes, with companions and followers all of them in like looſe and wanton garments; habited ſome of them like rural nymphs, as the *Dryades*, *Oreades*, &c. ſome like ſea nymphs, as the *Nereides*, *Syrens*, &c. ſome like *Satyrs*, *Fawns*, *Sylvans*, &c.

The women's garments indicate, that wine makes a man faint, feeble and inconſtant like to a woman.

VI. *Pauſanias* ſays, that the *Eleans* pictured *Bacchus* with a long beard, cloth'd in a long gown, hanging down to his feet; holding in one hand a ſharp hook, and in the other a bowl of wine, and many vine-trees and other fruitful plants round about him.

VII. The *Cyrenians*, a people inhabiting the further parts of *Perſia*, depicted *Bacchus* in the likeneſs of a bull.

By this was intimated that Proſerpina *(the daughter of* Jupiter) *brought him forth in that form.*

VIII. The ſtatue of *Bacchus*, was alſo ſometimes ſet forth and adorn'd with garlands made of fig-tree leaves, in commemoration of a nymph (as ſome ſay) call'd *Pſyche*, who was by the Gods metamorphos'd into that plant.

In like manner the nymph Staphilis *(with whom* Bacchus *was alſo enamour'd) was transformed into the vine, from whence it is that thoſe plants are ſo exceeding grateful and pleaſant to this God.*

IX. *Bacchus* is painted with ſhort brown curl'd hair, cloth'd with either a *Leopard*'s skin or a green mantle, a tawny face, with a wreath of vine branches.

BACK PAINTING, *Metzo-tincto prints with oil colours.*

This art conſiſts chiefly in laying the print upon a piece of clear crown or *Cock-bill* glaſs, of ſuch a ſize as fits the print.

In order to do this, take your print and lay it in clean water for two days and two nights, if the print be on very ſtrong, cloſe and hard gumm'd paper, but if upon an open, ſoft, ſpungy paper, two hours will ſometimes ſuffice, or more according as the paper is.

The paper or picture having been ſufficiently ſoak'd, take it out and lay it upon two ſheets of paper, and cover it with two more, and let it lie there a little to ſuck out the moiſture.

In the mean time, take the glaſs the picture is to be put upon, and ſet it near the fire to warm, then take *Strasburg* turpentine, and it being in a gallipot, warm it over the fire, till it is grown fluid, then with a hogs hair bruſh, (the hairs of which have been well faſten'd by wedging) and with that ſpread the turpentine very ſmoothly and evenly on the glaſs.

When this has been done, take the *metzo-tincto* print from between the papers, and lay it upon the glaſs; beginning firſt at one end, rubbing it down gently as you go on, till it lie cloſe, and there be no wind bladders between.

Then with your finger or fingers, rub or roll off the paper from the backſide of the print, till it looks black, *i. e.* till you can ſee nothing but the print like a thin film left upon the glaſs, and when you have done this, ſet it by to dry.

And when it is dry, varniſh it over with ſome white tranſparent varniſh, that the print may be ſeen through it, and then it is fit for *Painting*.

Note, You muſt be very careful in rubbing or rolling the paper off the print, ſo as not to tear it.

You may inſtead of ſoaking your prints two days and two nights, roll them up and boil them for about two hours, more or leſs (according to the quality of the paper) in water, and that will render it as fit for rubbing, rolling or peeling (as the other way.) when rubb'd with your fingers.

This being done, and your oil colours prepar'd according to the directions given (which you will find under each article as red, blue, green, *&c.*) they being ground very fine, and temper'd up very ſtiff, lay on the backſide of the tranſparent prints, ſuch colours as each particular part does require; letting the maſter lines of the print ſtill guide your pencil, and ſo each particular colour will lie fair to the eye on the other ſide of the glaſs, and look almoſt as well as a painted piece, if it be done neatly.

Note, That the ſhadows of the print are generally ſufficient for the ſhadow of every colour, but if you have a mind to give a ſhadow by your pencil, then let the ſhadows be laid on firſt, and the other colours afterward.

Take notice alſo, that in laying on of colours in this kind of *Back-ſide Painting*, you need not be curious as to the laying them on ſmooth. This is not at all requiſite here, where the chief aim is only to have colours appear well on the foreſide of the print; and therefore the only care to be us'd in this work, is to lay the colour thick enough, that its body may ſtrike the colour of it plainly through the glaſs.

BAL. SEN. ſignifies *Baldaſſar Senenſe*, i. e. *Baldaſſar Peruzzi* of *Siena*.

HB. HANS BALDUNG or BALDUIN, in a plate repreſenting horſes, engrav'd in 1534.

The ſame mark was us'd by *Hans Broſamer*, in his plates of *Curtius* riding into the gulph, and in his *Lacoon*, and *Solomon* worſhipping the idol. See plate No 11.

Horatio Borgiano, alſo made uſe of the ſame mark in his plates, and ſometimes us'd an H and a B.

BACCIO BANDINELLI, born in the year 1487, ſcholar of *Gio. Franceſco Ruſtici*, liv'd at *Rome*, excell'd in hiſtory painting and ſculpture, died in the year 1559, aged ſeventy two years.

I. BANTAM-WORK, as the JAPAN-WORK, is both *plain* and *emboſs'd*, and is wrought moſt in *gold* and other *metals*. So the *Bantam-Work* is alſo *plain* and *carv'd*, and is wrought moſt of it in *colours*, with a very ſmall ſcattering of gold here and there.

II. The wood is prepar'd for this work, the ſame as it is for the *Japan-Work*, and the *priming* with *whiting* is the ſame: and as to the *flat-work* it is done in *colours*, mixt with *gum-water*, as the nature of the deſign requires, the ordering which colours with the *gum-water*, is taught in *Japan-Work*, &c.

III. The *carv'd work* is perform'd after the following manner. Let either cabinet, tables, boxes, *&c.* be made of deal or ſome other coarſe wood; prime it with *ſize* and *whiting*, letting it dry; this muſt be ſo often repeated till the priming is almoſt a quarter of an inch thick, letting it ſtand to be thoroughly dry between every time.

IV. But you muſt take notice of this, that the *whiting* and *ſize* muſt be made thinner than for *Japan-Work*, and for that reaſon it muſt be done ſo much the oftener; for if it is too thick, it will not only lie rougher and be apt to crack and flie off; but it will not ſo eaſily penetrate to the bottom of any crack, nor go into any little crevice, notch or hole, as it will certainly do, if it is pretty thin.

V. *The piece being prim'd to its due thickneſs and thorough dry*, is in the next place to be water plain'd, *viz.* to be rubb'd with a fine rag, and a little fair water; after which, being dry, ruſh it as ſmooth as you can.

VI. *That*

VI. *Then lay on the black and varniſh it up with a good body*; and after it has ſtood to dry for ſix or ſeven days, poliſh it with *tripoli*, water and a fine rag, rubbing it with an even, eaſy and gentle hand.

VII. *When this has been done, trace and draw out your deſign with fine cinnabar and gum-water*; in the very ſame manner you deſign to cut and carve it, with all the circumſtantialneſs and exactneſs poſſible.

VIII. *Make your human figures, birds, beaſts and inſects, houſes, trees, flowers, rocks,* &c. *in their due meaſure and proportions*; the foldings of garments, leaves of trees and plants, and all other things, draw them ſo, as if they were ſo to remain without the leaſt alteration.

IX. *Then being provided with a ſharp graver, and other cutting inſtruments of different forms,* cut out the work deep or ſhallow, as you think beſt, but taking care never to cut deeper than the whiting lies; for the wood itſelf ought not to be touch'd with the graver.

X. *Alſo leave black ſtrokes for the drapery and folding of garments, and for the diſtinguiſhing of one thing from another*; carving where the white is, and leaving the black untouched, according as the pattern is; taking inſtructions alſo from the variety of *Bantam* pieces, which differ vaſtly from thoſe of *Japan*, in the very manner of the draughts, as well as in their other performance and finiſhing.

XI. *The carv'd work being cut out clean and ſmooth and finiſhed*, and the colours well mixt, lay them into your carv'd work, with fine and clean pencils, according as reaſon and the nature of the thing ſhall direct.

XII. *The colours being laid on and finiſhed*, then lay on the gold on thoſe places for which you deſign it; which may be either *powder gold* or *braſs duſt*, mixt with *gum water*; but rather let it be *leaf gold*, becauſe it not only looks richeſt, but is that which the *Bantam* artiſts always uſe.

XIII. *But the gum water it is laid with muſt be ſomewhat ſtronger*; and muſt be laid on with a pencil, and while it is moiſt the gold muſt be laid on; being firſt cut with a very ſharp, ſmooth edg'd knife into little pieces, either on a *leather-cuſhion*, or on a piece of leather ſtraitly nail'd to a board.

XIV. *Take up the gold with a little cotton*, and with the ſame dab it cloſe upon the work, and then (if your *gum-water* is ſtrong) it will look rich and beautiful: otherwiſe (if it be weak) it will appear, as if it were hungry and ſtarv'd when it is dry.

XV. *When all theſe things have been done*, clear up the black with oil, but without touching the colours, leſt you ſhould rub them off or ſully them; for this is not ſecur'd as the flat *Ban-*

tam-Work is; if any wet ſhould come to them, the colours would ſpoil and come off.

In this caſe it is beſt to leave out the *tarniſhing* colours, and only uſe ſuch as you may apply the *ſecuring varniſh* to without loſs of their ſplendor and beauty.

JOHN BAPTIST GASPARS, commonly called LELY's BAPTIST, was born at *Antwerp*, and brought up in the ſchool of *Thomas Willeborts Boſſaert*, a diſciple of *Van Dyck*; coming over into *England* in the time of the civil wars, Major General *Lambert* took him into his ſervice; and upon the happy reſtoration of King *Charles* II. Sir *Peter Lely* being received for his Majeſty's principal painter, he employed *Baptiſt* to paint his poſtures, which he performed very well; after his death, he did the like for Mr. *Riley*, and afterwards for Sir *Godfrey Kneller*. This *Baptiſt* was a great judge of painting, and likewiſe eminent for his deſigns for tapeſtry, having been an admirable draftſman in the academy. He died in *London* about forty years ago, and lies buried at St. *James*'s.

JOHN BAPTIST MONNOYER, commonly ſtiled the flower painter, was born at *Liſle* in *Flanders*, and brought up at *Antwerp*. His buſineſs there was hiſtory painting; but he afterwards returned to *Liſle*, and applyed himſelf to flowers, wherein he ſucceeded to admiration. *Monſieur le Brun* having undertaken the painting of *Verſailles*, employed *Baptiſt* to do the flower part, wherein he ſhewed his excellence, as is yet to be ſeen in that palace.

His grace the Duke of *Montague* being embaſſador in *France*, and obſerving the curiouſneſs of this painter's works, invited him over to *England*, and employed him in conjunction with Meſſieurs *Rouſſeau* and *La Force*, to adorn his magnificent houſe at *Bloomsbury*, where a great variety of flowers and fruit of this maſter are to be ſeen, and thoſe the beſt of his performance.

There are alſo ſeveral other pieces of his at the Lord *Carliſle*'s, the Lord *Burlington*'s, and other perſons of quality; but the moſt curious of all is the looking-glaſs at *Kenſington*-houſe, which he painted for the late Queen *Mary*.

They are alſo of an ordonnance very beautiful and ſurprizing, bearing a great price ſuitable to their worth. His beſt performances were owned to be in *England*. He died in *England* about thirty-ſix years of age, and lies buried in St. *James*'s.

FRANCIS BARLOW was born in *Lincolnſhire*, and at his coming to *London*, put apprentice to one *Shepherd* a face-painter, whom he lived with but few years, becauſe his fancy did not lie that way, his genius leading him wholly to drawing of fowl, fiſh, and beaſts, wherein he arrived to that perfection, that had his colouring and penciling been as good as his draught, which are moſt exact, he might eaſily have excelled all thoſe that went before him in that kind of painting; of which we have an inſtance in the ſix books of prints after him, ſold by Mr. *Tempeſt*. He drew ſome ceilings of birds for noblemen and gentlemen in the country.

He alſo drew ſeveral of the monuments in *Weſtminſter-Abbey*, and in *Henry* VII's chapel, which were intended for a large edition of Mr. *Keep's Monumenta Weſtmonaſterienſa*; but he died in the year 1702.

Caval. GIO FRANCESCO BARBIERI da CENTO, called GUERCINO, born in the year 1590, ſcholar of *Bennedetto Genuari*, liv'd at *Rome* and *Bologna*, excell'd in hiſtory, died in 1666, aged ſeventy ſix years.

FREDERICO BAROCCI, born in 1528, ſcholar of *Battiſta Venetiano*, ſtudied *Rafaelle* and *Correggio*, liv'd at *Urbino* and *Rome*, excell'd in hiſtory, chiefly religious ſubjects, died in 1612, aged eighty four years.

DOMINICO BARRIERA of *Florence*, who went commonly by the name of *Dominico Florentino*, us'd the mark in plate 12. marked ſome plates D. 1647. the ſame mark was us'd by *Domenico Bonavera* an engraver of *Bologna*, and *Dominico Bettini* the painter, in his pieces of flowers and animals.

BASHFULNESS is repreſented by a virgin clad all in white, with a veil over her face of the ſame colour; holding a lily in her right hand, a tortoiſe being under her feet. The white veſtment denotes her chaſte intentions; her veil to hide her face intimates, that a virtuous woman ought rather to hide, than to expoſe her beauty. The lily alſo repreſents innocence and baſhfulneſs; and the tortoiſe, that a chaſte woman ſhould not go much abroad.

BASSO RELIEVO } a piece of ſculpture, the figures of
BASS RELIEF } which do not project far, or ſtand out from the ground with their full proportion.

M. *Felibien* diſtinguiſhes three kinds of *Baſſo Relievo's*; in the firſt, the front figures appear almoſt with their full *Relievo*; in the ſecond, they ſtand out but one half; and in the third, much leſs, as in coins, vaſes, *&c.* See RELIEVO.

B. C. *Equ.* ſtands for *Bartholomew Ceriolanus* of *Bononia*, Knt.

MARY BEAL was an *Engliſh* Gentlewoman, born in *Suffolk*, having learnt the rudiments of painting of Sir *Peter Lely*. She drew after the life, and had great numbers of perſons of good rank ſat to her; eſpecially the greateſt part of the dignified clergy of her time, an acquaintance ſhe got by her husband, who was much in favour with that robe. She was little inferior to any of her contemporaries, either for colouring, ſtrength, force or life, inſomuch that Sir *Peter* was greatly taken with her performances, as he would often acknowledge. She work'd with a wonderful body of colours, was exceedingly induſtrious, and her pictures are much after the *Italian* manner, which ſhe learnt by having copied after ſeveral of the great maſters of that country, whoſe pictures ſhe borrowed out of Sir *Peter*'s collection.

She died at her houſe in *Pall-Mall* about thirty two years ago, being ſixty five years old, and lies buried in *James*'s.

NICOLA BEATRICI *Lotharingius fecit*, uſed theſe marks. See plate, No. 13, 14.

BEASTS. For drawing the form of any beaſt, begin with your lead or coal at the forehead, drawing downward the noſe, mouth, upper and nether chop, ending your line at the throat.

II. Then viewing it again where you began, from the forehead over the head, ears and neck, continuing till you have given the full compaſs of the buttock, then mark out the legs and feet.

III. Viewing it again, touch out the breaſt, with the eminency thereof; laſtly, finiſh the tail, paws, tongue, teeth, beard, and ſeveral ſhadows.

IV. In drawing beaſts you muſt be well acquainted with their ſhape and action, without which you will never perform any thing excellent in that kind: and here if you draw it in an emblem or the like, you ought to ſhew the landskip of the country natural to that beaſt.

As to the colouring of BEASTS.

I. SHEEP. Lay with a thin white, ſhaded with indigo and ſoot, and heightened with white.

II. HOGS. Lay with brown oker, ſhaded with ſoot, and heightened with maſticot: you may as you ſee occaſion colour the hair here and there with ſtronger brown oker; the eyes with vermilion, which you may heighten with maſticot; the mouth with indigo, or white and black, ſhaded with black.

III. A BEAR with brown oker, red oker and black mixt; ſhadow with ſoot alone, or mixt with black, and heighten with brown oker and white.

IV. A WOLF with brown oker and ſoot, and ſhadow with more ſoot.

V. A gray WOLF with black, white and brown oker; ſhaded with black and ſoot, or black only; the mouth with black and red oker; ſhaded with black and ſoot heightened with red oker and white.

VI. The ELEPHANT (which is of a mouſe grey) with black and white mixt with ſoot, and ſhaded with black and ſoot, and heightened with the ſame, with a little more white.

VII. The noſe at the end of his trunk, inwardly muſt be laid with vermilion and ceruſs, ſhadowed with black or black mixt with lake: in the ſame manner, the inner part of the ears, the eyes with white tending to a grey.

VIII. MICE are coloured as the Elephant. RATS a little browner.

IX. The UNICORN with a pure white, ſhaded with black; the chaps red, the eye and hoofs with a thin black.

X. The HART with brown oker, ſhaded on the back with ſoot, which ſweetly drive towards the belly, and ſhade over again with a ſtronger ſoot.

XI. The *neck* and *belly* with white, the mouth and ears a little reddiſh; the hoof black, the horns with ſoot, and ſhaded with ſoot mixt with black.

XII. The HIND with the ſame colours as the *Hart.*

XIII. The CONEY with black and white; the *belly* all white, ſweetened with black, and heightened with a ſtronger white.

XIV. The HARE with brown oker; the belly below a little whitiſh; ſhade on the back with ſoot, and heighten on the belly with white.

XV. APES, MONKEYS, and the like, with pink and black, heightened with maſticot and white; lay the face with a thin black, mixt with ſoot, ſhaded with black and pink mixt with a little red oker.

XVI. CATS of grey and browniſh, or tabby, with indigo, blue and white, heightened with pure white, and ſhaded with *Indian* blue and black mixt: if of other colours, you may uſe your diſcretion.

XVII. An ASS, colour with black, mixt with white like grey; if the Aſs be of a mingled brown, black and white mixt with brown oker, ſhaded with black in the mouth; heighten with white.

XVIII. The LEOPARD with brown oker and red oker, mixt with black, ſhadow it with ſoot; the ſpots with red oker and black, the mouth with black and white, heighten him with light oker.

XIX. HORSES, OXEN, COWS, DOGS, and ſuch like, if white, with white, mixt with a little ſoot or oker, ſhaded with a little black and white, and heightened with perfect white.

XX. If of a *cheſnut brown*, with red oker and black, ſhaded with black and ſoot, and heightened with red oker and white.

XXI. If an *aſh grey*, with black mixt with white, ſhaded with black, and heightened with white.

XXII. If *black*, with a thin black, ſhaded with a ſtronger black, and heightened with black and white.

XXIII. A bay HORSE, with vermilion and brown oker; or only with red chalk, ſhaded with red oker, and heightened with red chalk mixt with white.

XXIV. If *ſpotted*, by a mixture of the foreſaid colours, and diſcreetly putting every one in his proper place.

Gold BEATING. Firſt a quantity of pure *Gold*, is melted and form'd into an ingot; this by forging is reduc'd to a plate about the thickneſs of a ſheet of paper, and this plate is afterwards cut into little pieces about an inch ſquare, and laid in the firſt and ſmalleſt mould to begin to ſtretch them.

From what *Pliny* relates, we have no room to doubt but that the ancients, eſpecially the *Romans*, had the ſame method of *Beating Gold* that we have, though it ſhould ſeem they did not carry it to the ſame height.

If it be as *Pliny* relates, that they only made five hundred leaves four fingers ſquare of an ounce of *Gold*; though he ſays they could make more.

The modern *Gold Beaters* do make *Gold* of divers thickneſſes; but there are ſome ſo fine, that a thouſand of them don't weigh above four or five drams.

The thickeſt are us'd for *gilding* on iron and other metals, and the thinneſt for wood. See GILDING.

This *Gold* is beaten on a block of marble, commonly call'd *black marble*, of about four foot ſquare, and uſually rais'd three foot high; theſe plates are beaten with three hammers of different ſizes, of well poliſh'd iron, ſomething in the form of mallets. The firſt which weighs three or four pounds, ſerves to chaſe or drive; the ſecond eleven or twelve pounds, which is to cloſe; and the third which weighs fourteen or fifteen pounds, to ſtretch and finiſh.

Likewiſe four ſorts of moulds of different ſizes are us'd. Theſe pieces of an inch ſquare, are put into the firſt or ſmalleſt mould which is made of vellum, conſiſting of forty or fifty leaves, and after they have hammer'd a while thus with the ſmalleſt hammer, they cut each of them into four, and put them into the ſecond mould of vellum, which conſiſts of two leaves, to be extended farther.

Then they are taken out again, and cut into four, and put into the third mould, which is made of bullock's gut, well ſcour'd and prepar'd, and conſiſting of five hundred leaves, and beaten; then they are taken out and divided into four again, and laid in the laſt and finiſhing mould, which is alſo of bullock's gut, and containing five hundred leaves; and there they are beaten to the degree of thinneſs requir'd.

The leaves being thus finiſh'd, are taken out of the mould and diſpos'd in little paper books prepar'd with *red bole*, for the

Gold not to ſtick to; each book uſually containing twenty five leaves. Theſe books are of two ſizes, twenty five leaves of the ſmalleſt, of which weigh but five or ſix grains; and twenty five of the largeſt, nine or ten grains.

Gold is *beaten* more or leſs, according to the quality or kind of the work it is deſign'd for; that which is for the uſe of *Gold* wire-drawers to gild their ingots withal, is left much thicker than that for gilding picture frames, *&c.*

BEAUTY. Heavenly *Beauty* has been repreſented by an exceeding fine woman, naked, ſtanding upright, with her hand reaching the clouds and encompaſſed with rays, holding in one hand a lily, and in the other a celeſtial globe.

DOMENICO BECCAFUMI, otherwiſe called MICARINO *da Siena*, born in the year 1484, copied after *P. Perugino*, and ſtudied after *Michael Angelo* and *Rafaelle*; liv'd at *Rome* and *Siena*, excell'd in hiſtory, painting and ſculpture, died in the year 1549, aged ſixty five years.

DOMENICO BECCAFUMI SANESE, a painter and engraver, uſed this mark. See plate, No. 15. This mark is alſo found in certain wooden cuts copied from *Titian*'s paintings. He died in 1549.

The BEGINNING is repreſented by a reſplendent ray in a ſtarry sky, enlightening the earth adorn'd with plants, ſurrounding a youth, with a cloud covering his privy members; he holding in one hand the figure of nature, and with the left a ſquare wherein is the letter A *alpha.* The *ray* denotes the power of God being the firſt agent, the *ſtars* the power of the planets, the principle of generation, *nature* the beginning of motion; the *alpha* A the beginning of the *Greek* vowels, without which no word can be expreſſed.

Belli fecit. Means *James Belli.*

GIOVANNI BELLINI, born in 1421, liv'd at *Venice*, diſciple of his father *Giacomo*, excell'd in hiſtory, portraiture and architecture, died in the year 1511, aged ninety years.

GENTILE BELLINI, born in the year 1421, diſciple of his father *Giacomo*, liv'd at *Venice* and *Conſtantinople*, excelled in hiſtory, portraiture and architecture, died in the year 1501, aged eighty years.

1. OIL of BEN. The little nut which the *Arabians* call *Ben* is the ſame that is by the *Latins* call'd *nux unguentaria*, and by the *Greeks balanus myrepſica*, from which is taken an oil of very great uſe in the art of perfuming.

2. To make the *Oil of Ben*, blanch the nuts and pound them in a mortar, ſprinkling them with wine; then put them into an earthen or iron pan, and heat them hot; after that put them into a linen cloth, and preſs them with an almond preſs;

repeat this till you have expreſs'd all the *Oil*, and then you will have the *Oil of Ben by expreſſion.*

3. After the ſame manner you may expreſs the *Oil* out of citron ſeeds, that is alſo incomparable for this purpoſe to extract the ſcent out of *musk*, *civet*, *amber* and the like, becauſe it will not quickly grow rank; yet *Oil* of the *Nut Ben* is much better.

4. This *Oil of Ben* hath two properties; the one is, that having no ſcent or odour of itſelf, it alters, changes or diminiſhes not the ſcent of any *perfume* that is put into it: the other is that it is of a long continuance, ſo that it ſcarcely ever changes, grows rank, corrupts or putrifies, as other oils do.

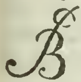
5. To make a perfume of this, put the *musk*, *amber*, &c. in fine powder into it, keep it in a glaſs bottle very cloſe ſtopt for a month or more, and then uſe it.

6. Or thus: Blanch your nuts and bruiſe them (hazle nuts may do though not ſo good) and lay them between two rows of flowers, as ſuppoſe *roſes*, *jaſſemin*, &c. or other perfumes; when the flowers have loſt their ſcent and fade, take them away and put freſh ones in their places; which repeat ſo long as flowers are in ſeaſon; then ſqueeze out the oil, and it will be moſt odoriferous.

7. Laſtly, by this laſt you may draw a ſweet ſcent out of flowers, out of which you cannot diſtil any ſweet water.

BENEFICENCE, is emblematically deſcrib'd by a damſel of an agreeable, pleaſant aſpect; young, becauſe the remembrance and acknowledgment of benefits ſhould never grow old; beautiful, becauſe *Beneficence* charms every one; naked, to ſhew that it ought to be without intereſt or oſtentation; holding in one hand a bag of gold and variety of jewels, as ready to diſtribute them; and in the other a chain of gold to ſignify that *Beneficence* ties and obliges.

PIETRO BERETINI *da* CORTONA, born in 1696, ſcholar of *Baccio Carpi*, liv'd at *Rome* and *Florence*, excell'd in hiſtory and architecture, died in the year 1669, aged ſeventy three years.



CORNELIUS BERGHEM or BERCHEN, uſed this mark.

BERYL. I. *To make a* Beryl *colour or green blue*, viz. *a ſea green for glaſs.* Take cryſtal frit without *manganeſe* what quantity you pleaſe, melt it very thin and skim off the ſalt (which will ſwim on the top like oil) with an iron ladle, or elſe the colour will be foul and oily: the matter being purified to twenty pound of it, put of calcin'd copper [ſee CALCINATION of COPPER] ſix ounces, *zaffer* prepar'd an ounce and a half, mix them well together: put this mixture into the pot of metal by little and little, for fear the cryſtal ſhould riſe or ſwell and run over; keep it ſtirring all the while, and then let the metal ſtand and ſettle for three hours, that the colour may incorporate, and then ſtir it again.

Make proof of it, and after the powders have been mixt for twenty four hours, and having been ſtirred and mixed well, it may be wrought; becauſe the colour is very apt to fall to the bottom.

To make a paſte for a BERYL, *or sky colour call'd* aqua marina. Take rock cryſtal prepar'd (ſee rock CRYSTAL) ten ounces, minium or red lead twenty five ounces, zaffer prepar'd five drams five grains, reduce them all to a very fine powder, mix them and put them into a crucible able to reſiſt the fire, leaving an inch or more empty, cover it with an earthen cover, lute it well and dry it; put it into the hotteſt place of a potter's furnace, and let it ſtand as long as their pots; when cold break the crucible and you will find a fine sky colour. Or

Take rock cryſtal prepar'd ten ounces, *æs uſtum* one ounce, and fifteen grains, mix them, and in a crucible perform the work as the former.

II. *Another* Beryl *or* Aigue Marine. Take ten ounces of powder of rock cryſtal, fine ſalt of tartar (ſee SALT of TARTAR) ten ounces, ſalt of vitriol nine ounces; being all finely powdered ſearced and mixed in a braſs mortar proceed as in the firſt example.

III. *Another deeper* Beryl *or* Aigue Marine. Take ten ounces of rock cryſtal, of fine verdegreaſe three drams and one ſcruple, of fine ſalt of tartar thirteen ounces and a half, reduce all to a fine powder, mix them in a mortar, and proceed as before.

Another way. This *Beryl* colour is of a very fine sky colour, if you take one ounce of powder of cryſtal, one ounce of fine ſalt of tartar, and ſix ounces of ſalt of *vitriol*; the whole reduc'd to a fine powder in a braſs mortar, and ſearced through a fine ſieve, and proceed as in the others.

B. F. V. F. ſtands for *Baptiſt Francus Venetus*, ſecit.

BICE. As blue BICE bears the beſt body of all bright blues us'd in common work, as houſe painting, *&c.* but it is the paleſt in colour; it works indifferent well, but inclines a little to be ſandy, and therefore requires good grinding, and that on a very hard ſtone; it is a blue that lies beſt near the eye of any now in uſe except *ultramarine*; but this laſt is too dear to be us'd in ordinary work.

BIRDS. Begin the draught of them at the head (and beware of making it too big) then bring from under the throat the breaſt line down to the legs, there ſtay and begin at the pinions to make the wing, which being joined to the back line, will be preſently finiſh'd.

The eye, legs and train muſt be laſt, (always letting in *Birds* as in beaſts) the fartheſt leg be the ſhorteſt; their feathers, let them (as the hair in beaſts) take their beginning at the head very ſmall, and fall in one way backwards in five ranks, ſmaller and greater to concluſion.

The colouring of BIRDS *or* FOWLS.

I. The EAGLE, colour with black and brown oker, ſhadow it with black; heighten the feathers with brown oker mixt with white,

II. Lay the *bill* and *claws* with ſaffron, and ſhade with ſoot and lamp black the eyes with vermilion, heightened with maſticot, or with ſaffron ſhaded or deepened with vermilion, and the talons with black.

III. The SWAN with white mixt with a little black, heighten with fine and pure white, ſo that its plumes or feathers by that heightening may look well; the legs with a black colour.

IV. The *bill* with vermilion, ſhaded with lake, the eye, yellow with a black round in the middle, from which falls a blackiſh vein, deſcending to the bill.

V. The GOOSE with more white than black, *viz.* a light grey, heighten with a grey white; the legs with black, the bill like the *Swan.*

VI. The DUCK with a light grey, the head with a dark blue, and a dark green neck ſweetly interwoven, the belly with white; the legs with black mixt with a little white, *&c.* but be ſure to imitate the life.

VII. The TURKEY with black mixt with a little white, from the back towards the belly whiter by degrees, but the belly ſpeckled with black; and in like manner the wings.

VIII. Shade him with black, and the wings with indigo ſhaded with ſtronger indigo, the bill with black, the eye blue, heightened with white.

IX. To repreſent him angry or provok'd, let the naked skin of his neck be a blood red, which lay with vermilion mixt with lake, ſhaded with lake; but otherwiſe lay it of a whitiſh blue colour.

X. The GRIFFON with ſaffron, ſhaded with brown oker or ſoot.

XI. The PHEASANT with grey made of white and black, the feathers of a white grey, let the whole be ſhaded with black, and heightened with pure white; the eyes like the *Falcon*, the legs with pink, and ſhaded with black.

XII. The FALCON with brown oaker, and black mixt with white, and ſhadowed with black, and ſprinkled upon its breaſt; heighten it with white, let his talons be black, above the eyes, lay with ſaffron, and ſhade with vermilion; the bill with grey.

XIII. The STORK with grey, heightened with white, and the corners of his wings (near one half) with black, his long bill and legs with vermilion, ſhaded with lake.

XIV. The OWL with ceruſs, black and ſoot, ſhadowed with ſoot, and heightened with yellow oker and white, ſometimes white alone; the eyes yellow circled with white, the legs of a brown yellow.

BISTRE, } a colour made of chimney ſoot boil'd, and after-
BISTER, } wards diluted with water, ſerving painters to waſh their deſigns. Inſtead of this ſome uſe the ſtrokes of a pen, ſome *Indian* ink, others a black ſtone, *&c.*

BLACK, the proper *Black* for painting in water colours, is *Ivory Black*, which if it be pure and well ground, is of uſe in painting in *miniature*, but is not proper for colouring *prints*; for 'tis too heavy a colour and hides the beautiful ſtrokes of the graver, unleſs done with great care.

However if it be neceſſary to uſe *Black* by way of darkening a print, rather chuſe a ſtrong tincture of good *Indian* ink than the *Ivory Black*; but to colour pieces in *miniature* uſe the *Ivory Black* prepar'd as follows.

Grind the *Ivory Black* very well in gum water, then beat the white of an egg very well, till you perceive a kind of oily liquor ſettle to the bottom, this liquor mix with as much of the *Ivory Black* as you think will be proper to permit it to run freely in the pencil, and it will bear an extraordinary gloſs; and if the object is ſhining, ſuch as the wings of ſome beetles, mix with ſome of it a little white upon a *Dutch* glaz'd tile, till you find it light enough to relieve the ſhade, and then make another lighter mixture of the ſame; which being us'd on the brighter part of the ſubject, will produce the effect you deſire.

Printer's BLACK is moſt us'd, becauſe it is eaſieſt to be had, and ſerves very well in waſhing.

Note, You muſt never put any *Black* among your colours to make them dark, for it will make them dirty, neither ſhould you ſhadow any colour with *Black*, unleſs it be *Spaniſh* brown, when you would colour an old man's gown, that requires to be done of a ſad colour, for whatever is ſhadowed with *Black* will look dirty; and not bright, fair and beautiful.

Ivory or *Velvet* BLACK, is made of *Ivory* burnt, generally between two crucibles well luted: which being thus rendred perfectly *Black*, and in ſcales, is ground in water, and made into troches, or little cakes us'd by the painters; as alſo by the jewellers, to blacken the bottom or ground of their collets;

wherein they ſet their diamonds, to give them their teint or colours.

Lamp BLACK, } is the *Smoke* of roſin, prepar'd by melting
Smoke BLACK, } and purifying the roſin in iron veſſels, then ſetting fire to it under a chimney or other place made for the purpoſe, and lin'd at the top with ſheep skins or thick linen cloth, to receive the vapour or *Smoke* which is the *Black*; in this manner they prepare vaſt quantities of it at *Paris*.

This *Black* may alſo be made by the burning of *Lamps*, having many wicks, covered with a very large top at a due diſtance, to receive the *Smoke*, which continually ſticking upon the top, produces this *Black* colour; the top of this *Lamp* may be taken off every half hour, and the *Black* ſwept off it; then the wicks being ſnuffed, and the cover or top being put on again, repeat this till you have what quantity of colour you deſire, or till all the oil is burnt out; this *Black* is of excellent uſe for *Black varniſh*. A quart of oil worth about ſix or eight pence will make (as ſome ſay) *Black* enough to do a large cabinet.

In *England* it is uſually prepared from the reſinous parts of woods, burnt under a kind of tent, which receives it; it is us'd on various occaſions, particularly in printers ink; for which it is mixt with oils of turpentine and linſeed, all boil'd together.

This is to be minded, that this *Black* takes fire very readily, and when on fire, is very difficult to be extinguiſh'd; the beſt method of putting it out is with wet linen, hay or ſtraw, for water alone wont do it.

A way to make Lamp Black better. Make a fire ſhovel red hot, and lay the colour upon it, and when it has done ſmoaking it is enough; it may be us'd with gum water and ought not to be ground when us'd with oil.

To make a finer Lamp Black than is uſually ſold. It is made with lamps of oil, ſomething being laid cloſe over to receive the *Smoke*.

German or *Frankfort* BLACK, is made of the lees of wine burnt, then waſh'd in water and ground in mills for that purpoſe, together with ivory or peach ſtones burnt.

This *Black* makes the principal ingredient in the rolling-preſs printers ink.

It is moſt generally brought from *Frankfort*, *Mentz* or *Straſburg*, either in lumps or powder.

That which is made in *France*, is not ſo well eſteem'd as that made in *Germany*, by reaſon of the difference of the lees of wine us'd in the one and the other; though on the other hand ſome prefer that made at *Paris* to that made at *Frankfort*.

Foreign Lamp BLACK, is no other than a ſoot rais'd from the roſiny and fat parts of fir-trees.

It comes moſtly from the northern countries, as *Sweden* and *Norway*; 'tis a *Black* that is more generally us'd than any other, becauſe of its plenty and cheapneſs, and proves a very good *Black* for moſt uſes; 'tis of ſo fine a body that if it be only tempered with linſeed oil, it will ſerve to work with on moſt common occaſions; without grinding; but being thus us'd, it will require a long time to dry, unleſs ſome drying oil be mixt with it; or which is better ſome verdigreaſe finely ground, this and the drying oil together, will make it dry in a little time.

Some add alſo oil of turpentine; and without theſe it will not dry under a long time, for in the ſubſtance of the colour is contain'd a certain greaſy fatneſs, which is an enemy to drying.

In order to remedy which, burn it in the fire till it be red hot, and ceaſe to ſmoke, which will conſume that fatneſs, and then it will dry much ſooner; but when it is burnt it muſt of neceſſity be ground in oil, for elſe it will not work fine; for fire is of that nature, that it is apt to harden moſt bodies that paſs through it. See *the article* BURNING *of* COLOURS.

This colour is uſually brought over to us in ſmall boxes, and barrels of deal of ſeveral ſizes.

There is a BLACK made of willow charcoal, which if ground very fine, does in oil make a very good *Black*; but not being ſo eaſy to be gotten as the *Lamp Black*, 'tis ſeldom us'd.

To make a BLACK *from* Sheeps *feet.* Take *Sheeps* bones, calcine them in an oven, or in a crucible in a furnace, and quench them in a wet cloth; they muſt be ground in water before any gum is put to them.

This *Black* will mix with lake and umber for carnation in *miniature* or water painting.

To dye wood, Horns and bones BLACK. Diſſolve vitriol in vinegar or ſpirit of wine, and infuſe them in it.

Another way. Take litharge and quick lime of earth two pound, mix them with a ſufficient quantity of water and put in the bones, and ſtir with a ſtick till they boil a-pace; then take it off the fire, and ſtir till it is cold, and the bones will be very *Black.*

Spaniſh BLACK is ſo call'd, becauſe firſt invented by the *Spaniards*, and moſt of it brought from them, is no other than burnt cork, us'd in various works, particularly among painters.

Earth BLACK, is a kind of coal found in the ground, which being well pounded is us'd by painters in freſco.

There is alſo a kind of BLACK, made of ſilver and lead, us'd to fill up the cavities and ſtrokes of things engraven.

BLACK *for painting or ſtaining glaſs.* Take ſcales of iron from the ſmith's anvil, grind them for three hours on a ſhallow, copper or braſs plate (ſuch as ſpectacle makers uſe to grind their glaſſes upon) take of this powder and of *Rocaille* of each what quantity you pleaſe, add to them a little calcin'd copper to hinder the iron from turning red in the fire; grind all to an impalpable powder, and keep it in a glaſs cloſe ſtopt for uſe.

BLACK. *As a velvet* BLACK *for glaſs.* Take pieces of glaſs of ſeveral colours, to which add a little leſs than half the quantity of *Manganeſe*, as of *Zaffer*, and put the whole into a pot in the furnace.

This glaſs being well purified may be wrought, and it will give a glaſs like velvet, fit for many things.

Another of the ſame, a much fairer velvet Black. Take ten pound of *cryſtal frit* in powder, and one pound of calx of lead, and of tin the ſame quantity; mix them all well together, and put them into a pot, heated in the furnace; and when this glaſs is melted and purified, you muſt caſt in an ounce and a half of ſteel calcin'd and powdered, and one ounce and half of ſcales of iron from the ſmith's forge, powdered and mixt with the ſteel; mix the whole well as you caſt them in, that the glaſs may not riſe, and the better to incorporate them.

Then let all reſt for twelve hours, during which time, ſtir them ſometimes, then you may work it, and you will have a very fair velvet *Black* colour.

Another velvet BLACK, *fairer than the foregoing.* Take twenty five pound of *Rochetta frit*, half a pound of tartar, an ounce and half of *Manganeſe* prepar'd, reduce all to powder, and mix them well together, put them into a pot, which ſet into the furnace leiſurely, that the matter don't riſe too much. Let it melt and purify during the ſpace of four days or thereabouts, mix the materials well, caſt them into the water the better to purify, and then melt them again; and you'll have a *Black* of an extraordinary beauty.

Dyers BLACK, is one of the five ſimple and mother colours us'd in *dying*. It is differently made according to the different quality and value of the ſtuffs to be *dyed*.

For broad cloths, fine ratines, druggets, *&c.* they uſe paſtel, or woad, and indigo; the goodneſs of the colour conſiſts in there not being above ſix pounds of indigo to a ball of paſtel, when the paſtel begins to caſt its blue flower, and in its not being heated for uſe above twice.

The ſtuff being thus *blued*, is boil'd with allum or tartar, then maddered, and laſtly, the *Black* given with galls, copperas and ſumach; to bind it and prevent its ſmearing in uſe, the ſtuffs are well ſcower'd in the fulling mill, when white, and then well waſhed afterwards.

For ſtuffs of leſs value, 'tis ſufficient, that they be well *blued* with paſtel, and black'd with galls and copperas. But no ſtuff can be regularly *dyed* from *white* into *Black*, without paſſing thro' the intermediate *blue*.

Yet there is a colour call'd *cold Black* or *Jeſuits Black*, prepar'd of the ſame ingredients as the former, but without being firſt *dyed blue*.

In this caſe the drugs are diſſolv'd in water, that had boil'd four hours, and ſtood to cool till the hand would bear it; then the ſtuff is dipt in again and again; and taken out ſix or eight times.

Some prefer this *Black* to the other, but on weak grounds this method of *dying Black*, is ſaid to have been invented by the *Jeſuits*, and to be ſtill practis'd in their houſes, where there remain numbers of *dyers*.

I. *To dye* BLACK. Take ſix handfuls of alder-bark or alder-tops, more or leſs, made ſmall, put them into a copper with a ſufficient quantity of water, and boil them for an hour with a very good fire; then take them out and put in two pounds of nut-galls bruis'd ſmall, one pound of ſumach, and four ounces of log-wood, and boil them; then enter twenty yards of cloth and handle it, and boil it for four hours; then take it out and cool it, and put in a pound of copperas; which when it is melted enter the cloth again and handle it, then boil it an hour and cool it again; then put in two gallons of chamber-lye, and enter the cloth again, and let it boil for half an hour more, then take it out, cool it and waſh it well.

II. *To dye a* Black *upon blue*. Take about nine or ten gallons of water, as many ounces of nut-galls beaten: wool, woollen yarn or woollen cloth or flannel, to the weight of about three pounds: let them be boil'd for four hours; after which take the matter out and air it; then put into the liquor eighteen ounces of green copperas, and if there be not liquor enough left, put in more water, as much as will cover the ſtuff, *&c.* and boil it for two hours, handling it continually.

Then take it out and air it, then put it in again, and take it out again and air it, and put it in again till it is *Black* enough; after this cool and waſh it.

But take notice if you put in ſome ſumach with the galls, it will make a better *Black*.

III. *Another* Black *dye*. Take fair water a ſufficient quantity, of nut galls bruiſed a pound, of ſumach half a pound; of alder-bark and oak bark, of each a quarter of a pound; make them boil, which when the water, *&c.* begins ſo to do, put in a little cold water, to break the boiling; ſtir all well together and enter your cloth, letting it boil for three hours; after this take it out, and put in more freſh water, and make it boil again, adding to it a pound of copperas, which when it is diſſolv'd put in your cloth again, and boil it two hours; then take it out again, and put in ſome more copperas, and half a pound of ground logwood, make it boil and put in the cloth again, and let it boil an hour.

This quantity of drugs will dye five yards of broad-cloth, or ten yards of cloth three quarters wide.

IV. *Another* Black *dye.* Take water a ſufficient quantity, logwood ground, ſumach of each a pound, of nut galls bruis'd ſmall two pounds; boil them together for an hour, then enter the cloth, wool, yarn, *&c.* and when they have boil'd an hour take them out, cool and air them; then put in three pounds of copperas, let it melt, and then put in the cloth, wool, *&c.* again, and let it boil near an hour, then take it out and waſh it.

Theſe quantities of drugs will dye twenty pound weight of any of the former things.

V. *Another to dye twenty yards of broad-cloth,* &c. Take water a ſufficient quantity, and five handfuls of ſumach, two handfuls of logwood ground, two handfuls of alder-bark bruis'd ſmall, boil them all together; then put in your cloth, and let it boil three hours; then take it out, cool and air it, and make it *Black* with a ſufficient quantity of copperas.

VI. *Another* Black *for twenty yards of broad-cloth.* Take water a ſufficient quantity, of nut galls bruis'd ſmall two pounds, of alder-bark a pound an half, mix all together in the copper, and ſet it a boiling, and when it does ſo put in the cloth, letting it boil for three hours; then take it out and let it cool; then put in half a pound of copperas, and when it boils, put in your cloth again and boil it for an hour more; handle it and boil it for an hour, then take it out and cool it; after which put in more copperas and ſome urine, then put the cloth in again, and boil it till it is *Black* enough.

VII. *Another* Black *colour.* Take a ſufficient quantity of water, and a pound of nut galls bruis'd ſmall, of logwood ground and ſumach half a pound, of alder-bark a quarter of a pound, make them boil and enter the cloth; then cool and air it, and then darken the colour as you deſire it with a pound and half of copperas.

This quantity is enough for fourteen pounds of wool, yarn, cloth, *&c.*

VIII. *To make a firm* Black *dye.* Firſt wadd it with the blue (ſee DYING BLUE) then take water thirty quarts, one pound of galls bruis'd ſmall, and of vitriol three pounds; firſt boil the galls and water with the ſtuff or cloth for two hours; then put in the copperas as a cooler; heat for one hour, after which take out the cloth or ſtuff, and cool it and put it in, boiling it for another hour; laſtly, take it out again, cool it, and put it in once more.

IX. *To recover the colour of* Black-cloth *when decay'd.* Boil the leaves of fig-trees well in water, waſh the cloth in it, dry it in the ſun, and it will be a much fairer *Black.*

To dye Martins skins with long hair of a very good Black, *which never fades.* Take a ſufficient quantity of water, two pounds of new nut galls, and two ounces of beef marrow; boil them in an earthen pot cloſe covered, ſtirring often leſt the galls burn, and boil, till it makes no noiſe when you ſtir it, then beat it, and ſtrain out:

Take of this liquor two pounds, copperas twelve ounces, roch allum twelve ounces, litharge eight ounces, verdegreaſe, ſumach and ſal armoniack of each four ounces; pound each of them ſmall diſtinct by itſelf, then mix and boil them together, and keep the liquor to dye with.

But this is to be minded; before you apply the liquor, the skins muſt be waſh'd two or three times in very pure, clear, lime water; and when you apply the dye you muſt do it with a pencil againſt the grains of the hair, and afterwards the other way too.

Theſe skins when dry, differ little or nothing from ſables. Some leave the verdegreaſe out, but it does no hurt to the liquor.

To dye cloth or ſtuff BLACK. Take two pound of galls, half a pound of *brazile,* two pound and a half of *madder*; boil your cloth three hours with theſe, then take it out and cool it very well, and put in an ounce and half of *ſal armoniack,* and boil the ſtuff gently for half an hour, rolling it upon the roller three times every quarter of an hour, then take it out and cool it; and afterwards add two pound and a half of *copperas,* one third part of a pound of *braſile,* a quarter of a pound of tallow; boil the ſtuff in it very well for an hour and a half, and it will be of a beautiful *Black* colour.

To dye woollen ſtuffs, &c. BLACK. Put into a kettle two pound of galls, half a pound of *braſile,* two pounds and half of *madder,* with which boil the ſtuff for three hours; then take it out and cool it very well; then add an ounce and half of *ſal armoniack,* and boil the ſtuff gently half an hour, rolling it upon the roller three times every quarter of an hour; then take it out and cool it; and afterwards add two pounds and a half of *copperas,* five or ſix ounces of *braſile,* and a quarter of a pound of tallow; boil the ſtuff very well in it for an hour and a half, and it will be of a beautiful *Black* colour.

Another BLACK *dye.* Fill a kettle with very clear water, in order for dying ten pieces of frize or coarſe ſtuff, put in it two pound and a half of right *Turkiſh* galls, and a pound and half of brown wood or walnut-tree; boil them very well together, then put in the ſtuffs and let them boil two hours, and alſo lie a whole night in the liquor; take them out, and if you have any old dye ſuds, that have been us'd before, pour it to the *gall liquor*, and add two pound of *copperas*; let them be boil'd well, then put in theſe ſtuffs; let them be boil'd for two hours, and afterwards left a whole night in the liquor, then rinſe them out, and hang them up to dry carefully and nicely, if it be in a kiln or ſtove it will be ſo much the better; then rub them with a pumice ſtone, and ſmooth them very well, then pour the dye out of the kettle and keep it, and repeat the operation mentioned in every particular; iron the ſtuff a little with a hot iron, and after you have done this, take water and two pound and half of *Turkey galls*, one pound and a half of brown wood, and dye them a third time after the ſame manner, and they will be *Black* enough.

But if you would have the dye more *Black* and beautiful, take a kettle full of fair clear water, put into it half a pound of calcin'd *vitriol*, and one pound of *tártar*, boil the ſtuffs in this liquor for an hour, then rinſe them out, and put freſh water into the kettle, and for every piece of twelve ells, put in half a pound of brown wood, and boil the ſtuffs half an hour; and if you would have the *Black* yet finer and better, then dye it once in the following ſoot dye.

The Soot dye. Gall the ſtuff with alder-bark and galls for three hours, and add lye and ſuds to blacken the gall dye; boil the ſtuff in the liquor for 2 hours; then add *copperas* and leave the ware in a whole night, and then rinſe it out.

To dye the Hamburg BLACK. It is to be ſuppos'd, that the ſtuffs have been firſt blued with woad or *indigo*, in a manner that is laſting.

Take twelve ounces of *tartar*, one pound of *vitriol*, boil the ſtuffs in it for two hours, then rinſe it clean and dry it.

Blue it as follows. If your dye be either *woad* or *indigo*, yet you muſt give the ſtuffs a deep ground, which will give them a brighter luſter.

For the ſecond blue, boil woad and brown wood, and blue the ſtuff to the depth of *indigo*, or to a ſort of iron grey, after which, it will be eaſy to dye it black; but the nicety lies in the bluing. After the bluing, the ſtuff muſt be rinſed clean, and dried again. Then follows

The Galling. Take ſix ounces of *galls*, two ounces of *madder*, a quarter of an ounce of calcin'd tartar, and therewith gall the ſtuff for the ſpace of an hour, not rinſed but dry'd; and then gall'd a ſecond time, the ſuds being a little ſtrengthened, or helped, as followeth.

The ſecond galling. Add half an ounce of *galls* to the remaining ſuds, and half an ounce of *madder*, one ounce of calcin'd cin'd *vitriol*, one ounce, not yet, of gum *arabick*; when you have done this, before the ſtuff is rins'd or dried, it muſt be

Blackened in the gall liquor as followeth. Boil the liquor, then take one pound of *vitriol*, firſt diſſolv'd in ſpring water, which muſt be pour'd into the dye; then add to the *alder*-black half an ounce of galls, one ounce of *madder*, one ounce of *white gum*, one dram of *maſtick*; and after the ſtuff has been died black in the dye, rinſe it out clean and dry it, now as well as after the ſecond blacking, which is to be done as followeth.

Take half a pound of *vitriol*, and immediately afterwards half an ounce of *galls*, one dram of *maſtick*, half an ounce of gum tragacanth, and both times let the ſtuff be an hour a blackening, till it hath got a laſting dye; and beſides all you may if you pleaſe add ſome *brown-wood* to give it the better luſtre, and preſerve it from ſpoiling.

The way of dying ſtuffs, the ſumach dye, ſo as it ſhall be very laſting. Put the eight following drugs into a large veſſel, *viz.* eight pound of *ſumach*, eight pound of *alder-bark*, twelve pound of *oak ſhavings*, nine pound of vitriol of copperas, two pound of wild or baſtard *marjoram*, ſix pound of filings of iron, and as much lye as is neceſſary, ſix pound of walnut-tree leaves, half a pound of calcin'd *tartar*, two pound of ſalt, and four pound of ſmall ſhot; put all theſe in when the water is hot, taking care that the veſſel is full, and look after it daily.

Firſt boil the ſtuff in the preparatory ſuds, compos'd of three quarters of a pound of *tartar*, and one pound of *vitriol*, for the ſpace of an hour and half; then rinſe and dry it, *then follows the galling.*

Take one pound and a half of *ſumach*, four ounces of *madder*, an ounce and half of calcin'd *ſalt petre*, one dram of *ſal armoniack*, an ounce and half of *vitriol*, half an ounce of calcin'd *tartar*; divide theſe drugs into two parts, and take two parts of galls alſo; put in the ſtuffs, take them out, but do not rinſe them, and hang them up to dry; then follows

The Blackening. Fill the *ſumach* copper with prepar'd dye, twice or thrice, and for every time add four ounces of vitriol, two ounces of *ſumach*, one ounce of *gum arabick*; and the laſt time ſuperadd half an ounce of *gum tragacanth*, and a dram of *maſtick.*

The ſtuff may be alſo boil'd with *brown-wood*, by adding ſix ounces of it to the firſt ſuds, as alſo half an ounce of *gum galbanum*, and an ounce of calcin'd *tartar* and vitriol mixt together.

The preparation of the SOOT BLACK *dye.* This dye is prepar'd and wrought the ſame way as the *ſumach dye*; excepting that the ingredients are different.

The drugs of it are as follow. Take eight pounds of *alder-bark*, ſix pound of *ſoot*, *oak-ſhavings* or *ſaw-duſt*, five pound of *vitriol*, one pound of *wild-majoram*, three pound of *brown-wood*, twelve ounces of calcin'd *alum* and *vitriol* mixt together, two pound of filings, as much *lye* as is neceſſary, and five pound of walnut ſhells, if they are to be had.

Put all theſe in when the water is boiling hot, as in the *ſumach* dye, and the ſtuff having been firſt of all prepar'd by boiling it an hour with ſix ounces of *tartar*, and half a pound of *vitriol*, and rinſed and dry'd; then gall it as follows,

With two ounces and a quarter of *galls*, and three quarters of an ounce of calcin'd *ſalt-petre* and *vitriol* mixt with this liquor.

It muſt be gall'd but once and not rinſed, but dried.

Then dye it as follows. Fill a kettle at two or three times, letting the liquor boil an hour every time, adding every time an ounce and half of *vitriol*, and two ounces of *ſoot*, half an ounce of *gum arabick*, and the laſt time a quarter of an ounce of *gum tragacanth*, half a dram of *maſtick*, and a quarter of a pound of ſalt.

The ſtuffs may be alſo blackened with *brown-wood*.

The Brown-wood dye is thus: Take four ounces of *Brown-wood* firſt boil'd, a quarter of an ounce of *gum albanum*, half an ounce of calcin'd *ſalt-petre* and *vitriol* mixt together, and you will have a good *Black*.

To dye GREEN *Thread* BLACK. Take a proper quantity of ſharp lye; and put into it three quarters of a pound of *brazile-wood*, boil them together, and afterwards pour the liquor into a vat, and add *gum arabick*, *alum* and *verdegreaſe*, of each one ounce; then put in the *Green Thread*, let it lie for the ſpace of one whole night, and it will become *Black*.

To dye SILK BLACK. Pour three pails of water into a copper, and add two pound of *beaten galls*, and two pound of *ſumach*, and two ounces of *madder*, four ounces of *antimony* reduc'd to an impalpable powder, two *ox galls*, one ounce of *gum tragacanth*; let them diſſolve a proper time, and then put in a proper quantity of dry alder-bark powdered, two pound of *vitriol*, and twelve ounces of filings of iron; then pour off the water as above, and let them boil together two hours; after which, fill it up with half a pail full of barley or rather malt water, which is drawn off by brewers; let it boil again half an hour, then put in the *Silk*; let it boil gently for half an hour, then take it out and rinſe it in a copper full of water, and throw it again into the dye; and afterwards when you take it out, rinſe it pure clean in river water; hang it up in the air to dye, then put it into the dye again, and boil it gently for half an hour as before; rinſe it alſo in the copper as before, and afterwards in river water, and when it is dry, take good lye, and add to it the eighth part of a pound of good pot-aſhes, rinſe the *Silk* very well in this liquor, and laſtly in river water, then dry it, *&c.*

This dye will alſo dye all ſorts of woollen ſtuffs.

An additional improvement to the former dye. Having dy'd the *Silks Black* as above, then take *ſal armoniack* and *antimony* powdered two ounces, filings of iron two handfuls; put them together in a copper, that has been drawn off, and hath been us'd before; make it ſo hot that you cannot bear your hand in it, that this compound help to the dye may the better penetrate.

Then take the *Black Silk* having been well dry'd and put it into the copper; let it lie there for an hour till it is thoroughly moiſtened, then draw it through water in which a proper quantity of *gum tragacanth* has been diſſolv'd, taking care that it be thoroughly wetted, then dry it as uſual.

To give a luſtre to Black Silks. After the *Silk* has been dy'd, for every pound of it take an ounce of iſing-glaſs, which ſteep in water and paſs the *Silk* through the liquor, and it will be of a very beautiful luſtre.

To dye SILK *of a very fine* BLACK. Take a copper of a tun of water, put in three quarters of a ſack of bark, three pound of *Provence* wood, three pound of *ſumach*, boil them for two hours, then ſtrain them into a fat, throw away the dregs and fill up the copper again; and then add ſeven pound and a half of beaten galls, half a pound of *agaric*, and a pound and half of *pomegranate* ſhells, a pound of *calamus*, a pound and half of *ſenna* leaves, a pound of *gentian*, and the ſame quantity of *marjoram*; boil all theſe together for two hours, ſtrain the liquor through a ſieve into the other dye, and let it digeſt for four days, ſtirring it often, and then put it into the copper in which you intend to dye; make a fire under it, and when it is hot, put in a pail full of lye, and boil all together very well, and when this is done, add half a pound of antimony, two pound of honey, a quarter of a pound of *borax*, half a pound of *litharge* of *ſilver*, and a quarter of a pound of *litharge* of *gold*, and half a pound of *verdegreaſe*; beat theſe together and put them into the kettle, and when the dye is warm, throw in fifteen pound of lockſmith's filings, ten pound of gum, and ten pound of copperas, and let theſe ingredients ſtand to ſettle eight days, ſtirring it, as occaſion requires; and after this you may dye with it, firſt putting in a pint of brandy.

A receipt to make a dye good. When it ſhall happen that the dye begins to work off, you ought to conſider what time of the month it was made, and what time work'd; then put three pailfuls of water into a kettle, and add to it two ounces of *borax*, half a pound of *agaric*, and a quarter of a pound of *litharge* of *ſilver*; four ounces of *madder*, half a pint of *brandy*, and a quarter of a pound of verdegreaſe; boil theſe all together for an hour, and then put them into the dye, and let it ſtand to ſettle for a fortnight, ſtirring it often.

Then make a liquor of two pound of *ſenna* leaves, two pound of *gentian*, one pound of *agaric*, two *pomegranate* ſhells, boil them together for two hours, and then pour them into the dye; when this has been done the dye will remain good for a hundred years; and the longer you dye with it, it will yield the finer *Black* colour; but then particular care muſt be taken that no ſoot get into it, for that will ſpoil it paſt all help.

But if any greaſe or tallow happens to fall into the dye, let it cool and take it clean out, and if you cannot ſee it, make the ladle red hot and ſtir the dye about, and that will conſume or burn up any greaſineſs; alſo fill two or three canvas bags with bran, and hang them in the dye while it is hot, and let it continue two or three hours, then take out the bags, and cover the dye with brown paper; and that will attract all the greaſineſs of it.

But when the dye begins to decay, whenever you dye, you muſt ſtrengthen and refreſh it in the morning with ſix pound of *gum*, ſix pound of *copperas*, four pound of filings, and a quarter of a pail of lye, then dye with it three days, ſix pound of *Silk* at a time.

When the *Silk* is dy'd it muſt be boil'd, and galled as follows:

To every pound of *Silk* take twelve ounces of galls, and boil them two hours, then wring the *Silk*; and lay it in the liquor for two nights and a day.

A BLACK *dye for re-dying hats or any thing that has loſt its* Black *colour.* Take half a pound of blue *Provence* wood, boil it in a pint of ſtrong beer, till half of it be conſumed; then add half a pound of *vitriol*, and an ounce of *verdegreaſe*, then take out the wood, and put in a quarter of an ounce of *gum tragacanth*; let it ſtand, and when you have occaſion to uſe it, dye a little bruſh in it, and ſo ſtreak it over the *Hat* wool or ſilk, and it will give a fine laſting *Black*.

BLACKNESS, is the quality of a *Black* body or a colour ariſing from ſuch a texture, and ſituation of the ſuperficial parts of the body, as does as it were deaden or rather abſorb the light, falling on it without reflecting any or very little of it to the eye.

In which ſenſe *Blackneſs* ſtands directly oppos'd to *whiteneſs*, which conſiſts in ſuch a texture of parts, as indifferently reflects all the rays thrown upon it, of what colour ſoever they be.

Sir *Iſaac Newton* has ſhewn in his *opticks*, that for the production of *Black* colours, the corpuſcles muſt be leſs than thoſe which inhibit any other colours; becauſe where the ſizes of the component particles are greater, there is too much light reflected to conſtitute this colour; but if there be a little leſs than is requiſite to reflect the white, and the very faint blue of the firſt order, they will reflect ſo little light, as to appear intenſely *Black*; and yet may, perhaps, reflect it variouſly to and fro within them ſo long, till it happen to be ſtifled and loſt; by which means they will appear *Black*, in all poſitions of the eye, without any tranſparency.

And from hence it appears why fire, and putrefaction by dividing the particles of ſubſtances, turn them *Black*; why ſmall quantities of *Black* ſubſtances impart their colour very freely, and intenſely to other ſubſtances to which they are apply'd; the minute particles of theſe by reaſon of their very great number eaſily over-ſpreading the groſs particles of others; hence alſo appears why glaſs ground very elaborately with ſand on a copper plate till it be well poliſh'd makes the ſand, together with what by rubbing is worn off from the glaſs and copper, become very *Black*; and why *Black* ſubſtances do ſooneſt of all others become hot in the light of the ſun, and burn (which effect may proceed partly from the multitude of refractions in a little room, and partly from the eaſy commotion of ſo very ſmall particles;) and alſo why *Blacks* are uſually a little inclin'd towards a bluiſh colour; for that they are ſo, may be ſeen by illuminating white paper by light reflecting from *Black* ſubſtances, where the paper will uſually appear of a bluiſh white; and the reaſon is, that *Black* borders on the obſcure blue of the firſt order of colours, and therefore reflects more rays of that colour than of any other.

It is neceſſary alſo to the production of *Blackneſs* in any bodies, that the rays be ſtopp'd, retain'd and loſt in them; and theſe conceive heat (by means of a burning glaſs, *&c.*) more eaſily than other bodies; becauſe the light that falls upon them is not reflected outwards, but enters the bodies, and is often reflected and refracted in them, till it be ſtifled and loſt. See LIGHT and COLOUR.

Obſervations on BLACK *Colours.*

Lamp Black, ⎫ is the moſt us'd, becauſe it is the eaſieſt to be
Printer's Black, ⎭ had, and is good in waſhing.

But you muſt never put *Black* upon other colours, to darken them, for it will make them dirty, nor ſhadow with *Black*, unleſs it be *Spaniſh brown*, when you would colour an old man's gown, which ought to be done of a ſad colour; all other colours ſhadowed with *Black* look dirtily, not bright, fair or beautiful.

Ivory Black, is the deepeſt *Black* that is, and is thus made; take *Ivory* in pieces, put it into a furnace till it be thoroughly burnt, then take it out and let it cool; pare off the outſide and take the blackeſt in the middle.

BLANCHING *in Coining*, is the preparation, that is given the pieces before they are ſtruck, to give them the luſtre and brillant.

The ancient method of *Blanching* was by firſt heating the pieces, and then putting them into a large veſſel of common water, and ſome ounces of *aqua fortis*; but in different proportions for gold and ſilver.

This method is now diſus'd, partly by reaſon of its expenſiveneſs, and partly becauſe it diminiſhes the weight of the metal.

Blanching, as it is now practis'd, is perform'd by heating the pieces on a kind of peel with a wood fire, in the manner of a reverberatory; ſo that the flame paſſes over the peel.

The pieces having been ſufficiently heated and cool'd again, are put ſucceſſively to boil on two other peels of copper, in which are *aqua fortis*, common ſalt and tartar of *Montpelier*; after they have been well drain'd of this firſt water in a copper ſieve, ſand and freſh water is thrown over them, and when they are dry they are well rubb'd.

BLEACHING, } is the art or method of *whitening* linens,
BLANCHING, } ſtuffs, ſilks, *&c* and is as follows.

For *Bleaching fine linens.* When they come from the loom, and while they are yet raw, they are to be ſteep'd a day in clear water, waſh'd out and clear'd of their filth, and then thrown into the bucking tub, fill'd with a cold lixivium or lye.

When theſe are taken out of the lie, they are to be waſh'd in fair water, then ſpread in a meadow, frequently watered from little dikes or canals interſpers'd in the ground, by means of ſcoops or a ſort of long hollow ſhovels, call'd by the *Dutch*, who invented them, *gieter*.

After the linen has lain a certain time on the ground, and every thing has been repeated as before, it is to be paſs'd thro' a new lie pour'd on hot, and again waſh'd in clear water, and laid a ſecond time on the ground; and then paſs'd thro' a ſoft gentle lie, to diſpoſe it to reſume the ſoftneſs, which the other ſharper lies had taken from it, then waſh'd in clear water, ſoap'd with black ſoap, and that ſoap is to be waſh'd out again in clear water; then it is to be ſteep'd in cows milk, the cream having been firſt skimm'd off, which finiſhes the *whitening*; and ſcowring gives it a ſoftneſs and makes it caſt a little nap; when it is taken out of the mill, it is waſh'd in clear water for the laſt time.

After all this proceſs, they give the linen its firſt blue by paſſing it through a water, wherein a little ſtarch, pale, ſmalt, and *Dutch* lapis have been ſteep'd.

In the laſt place, the proper ſtiffneſs and luſtre is given with ſtarch, pale, ſmalt and other gums, the quantity and quality of which may be adjuſted according to occaſion.

The whole proceſs of *Bleaching* is finiſh'd in fine weather in a month's time; in ill weather, it takes up ſix weeks or more.

To BLEACH *coarſe linens*, they are taken from the loom and laid in wooden frames, full of cold water, where they are ſo beaten by wooden hammers work'd by a water-mill, as to be inſenſibly waſh'd and purg'd from their filth; then they are to be ſpread upon the ground in order to receive the dew for eight days, which will take off more of the rawneſs: then they are to be put into a kind of wooden tubs or pans, with hot lye pour'd over them.

Having been thus lixiviated, they are again purg'd in the mill, then laid on the ground again for eight days more, then they are to be paſs'd through a ſecond lye; and all things repeated, till ſuch time as they have acquir'd their juſt degree of *whiteneſs*.

BLEACHING *woollen ſtuffs*. There are three manners of whitening woollen ſtuffs; the firſt is with water and ſoap, the ſecond is with vapour of ſulphur, the third with chalk, indigo and vapour of ſulphur.

For the firſt, when the ſtuffs are come from the fulling mill, they are to be put into ſoap'd water, pretty hot, and work'd afreſh by force of arms over a bench, which finiſhes the whitening which the fulling mill had begun; in the laſt place, they are to be waſh'd out in fair water and dried; this is call'd the natural way of *Bleaching*.

The ſecond method is what is commonly call'd *Bleaching* by the *flower*, thus; the ſtuff is firſt waſh'd in river water, and then put to dry on poles, and when it is half dry, ſpread out in a kind of ſtove wherein ſulphur is burnt, the vapour of which diffuſing itſelf, ſticks by little and little over all the ſtuffs, and gives it a fine *whitening*.

The third method is thus; after the ſtuffs have been waſh'd, they are to be thrown into cold water, impregnated with *chalk* and *indigo*, in which they are well agitated; they are waſh'd afreſh in elder water, then half dried on poles, and then ſpread in a ſtove to receive the vapour of the ſulphur, which finiſhes the *Bleaching*.

This method of *Bleaching* is agreeable enough to the ſight, yet is not eſteem'd the beſt method of *Bleaching*.

This is to be remembred, that when a ſtuff has once receiv'd the ſteam of ſulphur, it will ſcarce receive any beautiful dye, except black and blue.

BLEACHING *of Silk.* The *Silk* being yet raw, is put into a linen bag, and thrown into a veſſel of boiling river water, in which ſoap has been diſſolv'd, and thus boil'd for two or three hours; the bag being turn'd ſeveral times, taken out and beaten, then waſh'd out in cold water, and wrung out ſlightly, and thrown into a veſſel of cold water, mixt with ſoap and a little indigo.

The indigo gives it the bluiſh caſt that is obſervable in white *Silks.*

When it has been taken out of the ſecond veſſel, it is wrung out, and all the water and ſoap ſqueez'd out, ſhook out to untwiſt and ſeparate the threads, and hung up in the air in a kind of ſtove made on purpoſe, in which ſulphur is burnt, the vapour of which gives the laſt degree of whiteneſs to the *Silk.*

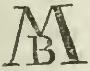
BLEACHING HAIR, is done by ſpreading the hair to be bleach'd upon the graſs, after the ſame manner as linen, after it has been firſt waſh'd out in a lixivious water.

This lye with the force of the ſun and air brings the hair to ſo perfect a whiteneſs, that the moſt experienc'd perſon may be deceiv'd therein; there being ſcarce any way of detecting the artifice, but by boiling and drying it; which leaves the hair of the colour of a dead walnut tree leaf.

There is alſo a method of dying hair with *biſmuth*, which renders white hair, which borders too much upon the yellow of a bright ſilver colour. This alſo may be prov'd by boiling; the *biſmuth* not being able to ſtand it.

BLINDNESS of mind, is repreſented in painting by a lady cloth'd in green, ſtanding in a meadow, full of various flowers, her head inclin'd, and a mole by her ſide.

The *mole* is an emblem of *Blindneſs:* her head inclin'd towards fading flowers, ſignifies worldly delights, which allure and buſy the mind to no purpoſe; for that whatever the flattering world promiſes, yet all is but a clod of earth, cover'd not only under the falſe hope of ſhort pleaſures; but with many dangers all our days.



MICHAEL LE BLON of *Franckfort*, us'd this mark; he died in *Amſterdam* in the year 1650.

To dye an Ox-BLOOD *colour.* Firſt tinge the ſtuff yellow, with a quartern and a half of *madder* to a pound of woollen ſtuffs, alum them and work them till they are of as beautiful a colour, as you would have them, then rinſe them well out, and put into the kettle a tub of ſtale urine, and boil it again, till they take the dye; then roll the ſtuffs three or four times thro' it, and rinſe them very clean.

To dye SILK *a* BLOOD *colour.* Soak the *Silk* as before directed, and for each pound of it take half a pound of *allum*, and a quarter of a pound of *tartar*, beat them ſmall and boil them in the quantity of a pail full of prepar'd liquor for a quarter of an hour; then put in the *Silk* and let it ſteep for two hours; then take it out, rinſe it and beat it on a block, and hang it up to dry.

Then put four ounces of galls powder'd into the quantity of a pail of water, ſet it on the fire, till it is juſt ſo warm as you can bear your hand in it, then put in the *Silk*, and let it lie for two hours; then take it out and dry it.

This being done, put a pound and half of *braſile* in a linen bag, and put in with it ſome good wheaten bran water into a kettle, boil them together, being cloſe cover'd; then take the kettle off the fire, and let it ſtand a whole night; then add a quarter of an ounce of *pot-aſhes*, and boil it again for an hour; then pour on as much river water, as the liquor.

Then take out the bag of *broſile*, and put in the *Silk* after it has been a little ſcumm'd; cover the caldron very cloſe, and let it remain there half an hour; then wring it out and rinſe it very clean in river water; wring it out again, and hang it out again, and let it dry, and if it be not enough dyed, boil the dye again, and put in the *Silk* once more and clean it with ſoap, as in the crimſon dye, and afterwards rinſe it in the river water, and you will have a beautiful red.

BLUE is one of the primitive colours, otherwiſe call'd *Azure.*

Painters *Blue* is made different, according to the different kinds of painting.

In *limning*, *freſco*, and *miniature*, they uſe indifferently *ultramarine*, *blue aſhes*, and *ſmalt*; theſe are their natural *Blues*, excepting the laſt, which is partly natural, and partly artificial.

In oil and miniature they alſo uſe indigo prepared: ſee INDIGO. As alſo a factitious ULTRAMARINE, which ſee.

Enamellers and painters upon glaſs have *Blues* proper to themſelves, each preparing them after their own manner.

Turnſole BLUE is a *Blue* us'd in painting on wood, made of the ſeed of that plant. The way of preparing it is to boil four ounces of *Turnſole* in a pint and half of water, in which lime has been ſlack'd.

Flanders BLUE is a colour bordering on green, and ſeldom us'd but in landskips.

To write on paper or parchment with BLUE *ink.* Grind *Blue* with honey, then temper it with glair of eggs or gum water made of iſing-glaſs.

BLUEING of *metals*, is perform'd by heating them in the fire till they aſſume a *Blue* colour; particularly practis'd by gilders, who *blue* their metals before they apply the gold and ſilver leaf.

To dye skins BLUE. Boil elder-berries or dwarf-elder, then ſmear, and waſh the skins therewith, and wring them out; then boil the berries as before in a diſſolution of alum water, and wet the skins in the ſame manner once or twice, dry them, and they will be very blue.

Another way to dye skins BLUE. Steep the beſt *indigo* in urine for a day, then boil it with alum, and it will be good; or temper the *indigo* with red wine, and waſh the skins therewith.

The Pruſſian BLUE. This *Blue* is next to *ultramarine* for beauty, if it be uſed in oil; tho' I am not certain whether it will hold ſo well as the other, conſidering it has not the body of *ultramarine.*

This colour'd does not grind well in water; becauſe there is ſuch an oily quality in it, that it does not mix kindly with water, and at the beſt will change, as it is now prepared in the common way.

Attempts have been made to make of it a blue ink; which indeed has held the colour for a month or two, but then turn'd to a muddy yellow.

And when you put your pencil with gum water into a ſhell of this *Blue*, you will find where the water ſpreads, the *Blue* will change yellowiſh, till the body of the *Blue* is well ſtirred up.

And after all that can be done with this colour in water, it will only ſerve to ſhade *ultramarine* with; but in oil it will ſerve very well for the preſent to ſupply the place of *ultramarine.*

BLUE BICE is a colour of a good brightneſs next to *Pruſſian Blue*, and alſo a colour of a body, and will flow pretty well in the pencil; eſpecially if it be well waſh'd, as is directed to be done of the *whites* and *minium.*

Saunders BLUE is alſo of very good uſe, and may ſerve as a ſhade to *ultramarine*, or the *blue bice*, where the ſhades are not required to be very deep; and is of it ſelf a pleaſant *Blue*, to be laid between the lights and ſhades of ſuch a flower, as is of a *mazarine Blue.*

A fine BLUE *from Mr.* Boyle. Take the blue leaves of rue, and beat them a little in a ſtone mortar, with a wooden peſtle; then put them in water, juice and all, for fourteen days or more, waſhing them every day till they are rotten; and at laſt beat them and the water together, till they become a pulp, and let them dry in the ſun.

This will produce as good a *Blue* as indigo, and be much ſofter; but in order to keep it a long time, when you beat it the laſt time, add to it a little powder of gum Arabick; of which you may put more or leſs, as you would have it more free or tenacious in the working.

This is a fine blue for ſhading, has a good body, and runs warm in the pencil.

INDIGO BLUE. This makes the ſtrongeſt ſhade for *Blues* of any other, and is a ſoft warm colour, when it has been well ground and waſh'd, with gum water, by means of a ſtone and muller.

It is made of what lightneſs you pleaſe, by putting more gum water to it; and by how much there is leſs, the darker it will be.

Before you uſe it upon a print, it will be proper to try it upon a *Dutch* tile, for it runs warmly in the pencil, and ſo perhaps may otherwiſe prove too ſtrong for your deſign, which is always to be taken care of, when a flowing colour is to be laid over a dark ſhade of a print; which ſhade will much heighten its blackneſs, and even make it appear quite black.

LACMUS *or* LITMUS BLUE. This is a beautiful blue and will run in a pen as free as ink. It is made of *lacmus*, or as ſome call it *Litmus*, which may be had at the druggiſts.

But as this colour is never to be met with prepar'd, I ſhall here ſet down the method of preparing it.

Take an ounce of *Lacmus*, and boil it in about a pint of ſmall beer wort, till the colour is as ſtrong as you would have it; then pour off the liquor into a gallipot, and let it cool for uſe; it will ſoon become a jelly, and by degrees grow hard.

But this colour is to be opened again, and made liquid by water, ſo as to be us'd as ink; and will be either paler or darker, as it is made thicker or thinner.

This affords a bright colour, and has extraordinary effects; for it is not only a beautiful, but a holding colour.

This colour if it be touch'd with *aqua fortis*, immediately changes to a fine crimſon, little inferior to carmine, and ſinks quite through the paper, ſo as not to be got out.

So that when this colour is us'd as blue, it is beſt to preſerve it from *aqua fortis*, or ſuch ſtrong acids.

It is a good ſhade for *ultramarine*, or *blue bice*, where the ſtrongeſt ſhades ſhould not be extremely deep; and for colouring of prints it is very good, as it is a tranſparent colour, and goes a great way.

A tranſparent BLUE *from Mr.* Boyle *equal to* ultramarine. This is a beautiful *Blue*, and the chief ingredient of which it is made, is the *cyanus* or blue *cornbottle flower*, which abounds almoſt in every corn field, and may eaſily be had, during four of the ſummer months; and may be gathered by children about the skirts or verges of corn fields, without doing any damage to the corn.

This flower has two blues in it, one of a pale colour in the larger outward leaves, and the other of a deeper *Blue* that lies in the middle of the flower.

Both theſe will do, being ſeparated from the buttons or caſes, in which they grow; but the deep blue leaves in the middle produce by much the beſt colour; which may be obſerv'd by rubbing the leaves while they are freſh, ſo hard upon a piece of good writing paper, as to preſs out the juice, and it will yield an excellent colour, which will not fade, as has been found by the experience of two or three years.

This part of the flower is therefore the principal and what may be depended upon; which ſhould be pick'd from the reſt of the flower leaves, the ſame day, if it may be, or the next, or as ſoon as poſſibly can be.

A good quantity of theſe middle leaves being procur'd, preſs out what juice you can from them, and add to it a little alum, and you will have a laſting, tranſparent *Blue*, of as bright a ſtaining colour as can be deſired, ſcarce inferior in beauty to *ultramarine*, and is durable.

As for the outward flower leaves which are paler, it is not certain that they will anſwer the end; but upon ſome trials being made, that may alſo be known.

Let the flowers be gathered about the beginning of *June*, or in *July* or *Auguſt*, and ſome may be found in *May*; but the preparation of the colour by picking out the middle deep blue flower leaves, and preſſing out the juice, muſt be preſs'd out with all the expedition poſſible, or they will loſe their perfections.

It is very probable, that if the chives of theſe blue corn-bottle flowers were cur'd in the ſame manner as ſaffron is, they would produce a much greater body of colour, from which a tincture might be drawn with more eaſe, than if preſſed raw or freſh from the field.

In order to do this, ſuch a kiln ſhould be prepar'd as is us'd for curing of ſaffron, in which may be made a ſmall charcoal fire, which will communicate an heat to the top of the kiln, which is to be covered with an hair cloth; upon which ſhould be laid four or five ſheets of white paper, ſuch as is us'd in curing of ſaffron; then a parcel of the picked flowers are to be laid on to the thickneſs of two or three inches, laying cloſe and flat with a knife, and ſprinkling with ſome thin gum water; then the cake of flowers is to be covered with two or three more ſheets of paper and a board with a ſmall weight laid on for a few minutes; after which the board is to be taken off, and the cake of flowers to be turn'd upon the kiln, taking hold of all the papers with both hands; and when it has been rightly plac'd, take off the upper papers, and ſprinkle the cake again with ſome thin gum water; and then ſettling the cake of flowers again with a knife, let the papers be laid on again with the board and weight for a minute or two, and then let the papers be turn'd again and again, till the cake of flowers becomes united, and of the thickneſs of a cake of ſaffron.

In this operation, you will find the flowers to grow darker and darker every time they are turned, till at length the cake will look of a deep *Blue* tending to black. From whence a tincture may be eaſily drawn.

During this operation, great care muſt be taken that the fire does not ſcorch the flowers; but that it be as conſtant and gentle as may be, which will be a ſure way to bring the flower cake to a good colour.

But it will not be improper for any perſon, who ſhall undertake the curing of this colour, to conſult the methods of curing ſaffron, of which they may be inform'd, either by a treatiſe of the method of curing ſaffron, written by Dr. *Dowglaſs*, or another by Mr. *Bradley* in his monthly treatiſe of husbandry and gardening.

If it ſhould be objected, that it will be troubleſome to make this BLUE COLOUR; let it be conſidered what pains and nicety there is in gathering and curing of ſaffron; which is ſometimes ſold at thirty ſhillings *per* pound, and ſeldom comes up to three pounds *per* pound. But this *Blue*, if it comes up to the colour of *ultramarine*, will be worth four or five pounds *per* ounce, eſpecially when it ſtains ſo well as this does.

Therefore it would, in all probability, be worth the while to have a piece of ground on purpoſe for this uſe, where nothing elſe but this *cyanus* or corn-bottle ſhould be ſown; and whereas this flower is ſaid to be plentiful enough in the fields between *Twickenham* and *Teddington* in *Middleſex*, ſo there might eaſily be ſeed enough procured for that purpoſe in half an hour's time to ſow an hundred acres.

As to the manner of cultivating this plant, every knob or head of ſeed muſt be opened before it is ſown, for each head contains a great number of ſeeds; as for the preparing of the ground to receive this ſeed, there need to be no more trouble and expence than common plowing requires; which being done, the ſeed is to be ſown either at the latter end of *Auguſt*, which will come up ſoon enough to ſtand the winter, and bloſſom early the *May* following; or elſe it may be ſown at the end of *March*, and it will begin flowering the *June* following.

At either of theſe ſeaſons, after the ground has been well plough'd, harrow it in with buſhes, and it will come up in a little time.

As to the choice of this ſeed, it will be neceſſary that it be gathered only in ſuch fields, where you are ſure there grows no *corn-bottles* of any other colour but *blue*; and then all the plants which riſe from ſuch ſeed, would produce *Blue*; but if they ſhould be gathered in ſuch places where there are varieties of them, then various ſorts are to be expected, as white, red, or purple, altho' we are ſure we gather the ſeed from ſuch as were truly of a *blue* ſort; for if there is a red flower of the ſame tribe growing near it, the difference of the colour will be ſo intermixt between both, that the ſeed of both will bring a variety from the principal, depending on the colours of both.

Obſervations on BLUE *Colours.*

Blue-Bice, is the moſt excellent blue next to *ultramarine*, and may ſerve inſtead of it.

It is too good a colour to uſe upon all occaſions, and *ſmalt* may be us'd inſtead of it for more ordinary uſes, but it will not work ſo well as *Bice*; therefore when you deſign to beſtow ſome coſt and pains upon a piece, you may uſe *Bice*, otherwiſe you need not uſe any other than *blue-verditer*; with which you may make a pretty good ſhift in ordinary works, although you ſhould have no other *Blue.*

Indigo is a dark *Blue*, and principally us'd to ſhadow upon other *Blues*. It makes a dark green, being mixt with yellow berries, to ſhadow other *greens* with in the darkeſt places.

Blue Verditer. It is a very bright pleaſant *blue*, and the eaſieſt to work with in water; it is ſomewhat inclining to a *green*, and the *blue* which is moſt of all us'd mix'd with yellow berries; it makes a good *green.*

The method of making a vat, and preparing hot ſuds for dying linen and woollen BLUE. Have a vat made big enough to contain eight pails of water, wide at the top, and narrow at the bottom; ſeaſon it for a day and night with hot water, and afterwards waſh it out with cold, then cut a four-ſquare hole at about the height of twenty one inches, and fourteen broad; and have a copper plate made of the ſame thickneſs with the wood of the *vat*; nail this upon the hole, placing the nails at the diſtance of the breadth of two fingers one from the other; the nails muſt be ſmall with broad heads to prevent its leaking; then place an iron hoop at the top and another at the bottom of the copper.

The hole muſt be made about a hand's breadth from the bottom of the vat.

When this has been done, plaiſter or brick it about, either leaving or making a hole in the plaiſter or brick-work, wider at the utmoſt end (and a little) narrower at that which comes to the copper itſelf; the ſhape of it being like an oven's mouth, that the wood be not injured, when the fire to heat the vat of ſuds is put into this vacancy.

Then for every half pound of *indigo*, you put in, in order to *blue* linen or woollen, take in eight pails of water, and into that ſix handfuls of coarſe wheaten bran, ſix or nine ounces of madder, a pound and half of pot aſhes; pour them all into a copper to make ſuds, and when the liquor boils ſo as to begin to ſwell and bubble up, throw in two or three quarts of cold water, and rake out the fire from under the copper.

Then having ready lime, prepar'd as the tanners uſe it, plaiſter the inſide of the empty vat with a handful or two of it, and afterwards pour all the ingredients out of the kettle into it, and cover it very cloſe.

The day before you do this, you muſt put your indigo to diſſolve in a quart or three pints of water in a clean veſſel of iron or braſs, adding half a handful of wheaten bran, and half a ladle full of *madder*, and half an ounce of pot-aſhes, and leave it a whole night over a coal fire; but it muſt not be ſuffered to boil, or grow hotter, than you can bear your hand in it.

You muſt alſo grind it with a peſtle, till it becomes as ſoft as pap, and is quite cleared of all roughneſs or harſhneſs; which being done, it is fit to be put into the vat to the other ingredients.

Then ſtir it about three or four times with a ſtick; then cover it up cloſe, and let it ſtand to ſettle twelve hours; then take off the cover, and put in half a quarter of an ounce of quick ſilver, and ſtir it about and cover it as before; then let it ſtand to ſettle for ſix hours; after which, throw in a ſmall ladle full of *lime duſt* or powder, or of the ſame that you before plaiſtered the vat with; then cover it cloſe again, and let it ſtand for three hours longer, and then put in half an ounce of *pot-aſhes*; ſtir it well about again, and put a coal fire in the hole before the copper plate in order to keep it warm, and let it ſtand three hours longer; after which, nothing is to be added, only ſtir it as before, and in an hour or two after you may dye with it as follows.

Hang five pieces of goods in it, keeping the bran and flour, *&c.* from it with your hand, to prevent its touching the linen as much as poſſible; wring the five pieces out one againſt another, then try by feeling with your finger, whether the dye be harſh, or ſoft and ſmooth, if it feels too rough, throw in half an ounce of pot aſhes; and if it be too ſmooth, add half a ladle full of lime.

Work the cloth or linen in it for two hours, put in five freſh ieces, and work them like the former, and when they are ry, wring them a ſecond or third time in the dye, till they ecome of a colour as deep as you would have them.

Your dye may be wrought in this manner, till you have dyed hirty pieces, and afterwards if you would dye any woollen ware, tockings or yarn, take a couple of pails full of water, into which put two handfuls of wheaten bran, and an ounce of *madder*, and a quarter of a pound of *pot-aſhes*, and hang it over the fire and boil it to the ſuds as before; then put it into the vat, and after you have ſtir'd it well about, let it ſtand to ſettle three hours.

Then try with your finger whether it is harſh or ſmooth; if it be too harſh, add half an ounce of pot-aſhes, and if too ſmooth, add half a ladle full of lime, and ſtir it about again.

If you would dye woollen ware alone, without linen, prepare a liquor of a ſufficient quantity of hot water, a handful of *madder*, and a handful or two of wheaten bran, boil them together, and wet the ſilken or woollen manufactures therein, hang them up and let them drop as long as they will; then put them into the abovementioned dye vat, letting them lie there till they are ting'd of as deep a colour as you would have them.

If you would dye your wares green, they muſt be firſt dyed *yellow* with *broom* or *dyers weed*, call'd alſo *yellow weed*, and then put into the beforementioned blue vat; but you muſt take notice that they muſt not be wetted in *madder* water, as the blue, and muſt be taken out of the vat as ſoon as they are dyed enough.

But you muſt be ſure not to dye above half a dozen pair of ſtockings, or a proportionate quantity of other woollen ware, before you put in your linen, which muſt be covered cloſe for half an hour, as ſoon as they have been put into the vat; then they muſt be wrung well about, then it muſt be let ſettle again, and wrung out again, and afterwards draw them out.

Then ſtir the dye again very well, and add a little lime or pot aſhes, according as either of them is wanted, and after that let it ſtand to ſettle for two hours, and then put in other goods to dye, which work as before, ſtirring it every two hours.

If you find the liquor does not dye or work well, let it reſt a day and night, keeping the fire to it all the while, and add half an ounce of *fœnugreek* powdered, and ſtir it well about, and the dye will come to itſelf again.

If you have ſo many things to be dyed, that you have occaſion to augment the quantity of indigo to two or three pound, yet you need not make your *madder*, *pot-aſh* and *bran-liquor* ſtronger than double the quantity of what is above preſcribed for half a pound,

A

A BLUE *Dye for* SILK. Procure a tub that may be cloſ covered, put into it a lye made of three pailfuls of river or rai water and clean *beech aſhes*, put in alſo two handfuls of *wheate bran*, two ounces of *madder*, two ounces of white wine *tartar* beaten to powder, one pound of *pot-aſhes*, half a pound of *indig* pounded ſmall; ſtir it very well with a ſtick every twelve hour for fourteen days, till it tinges a ſort of *green*, and when th dye is grown bright, it muſt be ſtirr'd every morning. Put th ſilk into a warm freſh lye, wring it out and ſtir it about in th dye ſome time afterwards, letting it hang in the dye, accordin to the cuſtom of dying; and beſides the blue copper, ther ought to be another copper full of lye, that when the ſilk i wrung out of the dye, it may be rinſed in it; and after it has bee wrung very clean out of that, rinſe it again in river water, bea it and dry it.

If the ſilk be moiſtened in this latter lye or ſuds, before it i dyed, there is no need of the firſt above-mentioned lye.

Several ſorts of *Blue* may be made with this dye, either brighte or darker at pleaſure, according to the time they are left in it and when the copper grows low, you may fill it up again out o the rinſing fat; but when the blue copper or fat grows weak then put in a quarter of a pound of pounded *indigo*, and hal a pound of *pot aſhes*, half an ounce of *madder*, an handful o *wheaten bran*, and a quarter of an ounce of *tartar* pounded, an let it ſtand eight days without uſing it, ſtirring it every twelv hours, and then you may dye with it again as before.

How to prepare a BLUE *dye.* Put a pailful of water into a kettle that will hold it, hang it over the fire; put in a handful of unſlack'd lime, two pound of *indigo*, one pound of *pot aſhes*, and let them boil together for an hour, letting them diſſolve.

Then having made clean a copper that will hold a tun o water, put into it two pound of *madder*, two pound of *bran*, and two pound of *pot aſhes*; boil them a little, and let them ſettle, and pour the *indigo* upon them; then ſtrain the *lye* alſo into the fat, but the *indigo* eſpecially muſt be digeſted very well, and diſſolved, and the copper fill'd with water, covered cloſe, and a fire made under it; ſuffer it to grow warm, but not hot, ſtirring it about every two hours till it ferments, and as ſoon as it begins to melt or digeſt, it will alſo begin to turn yellowiſh, and then you may dye with it, taking care that your hands are very clean, and free from all ſorts of greaſe.

When you have dy'd with the ſuds, you muſt ſtrengthen them afreſh with pot-aſhes; but you muſt take care to do this neither too much nor too little; for if you are guilty of either extreme, the whole copper full of lye is ſpoil'd.

Neither ought you to dye too often at one time; but betwixt every time you dye, the liquor muſt be very well ſtirred.

An excellent liquor to make the blue ſuds work, in caſe it happens that they will not, by reaſon of ſome defect. Take four ounces of *madder*, four ounces of *pot aſhes*, and two handfuls of *bran*; boil them together, and pour the liquor into the *blue* ſuds; ſtir it well about, and it will make it work; and if it be too much fattened with aſhes, then hang a bag of wheat flour in it, and that will attract all the fatneſs to it; and if it be yet defective in any particular, add to it a ſmall quantity of *ſalt-petre*, and that will bring it to a fermentation, as will alſo a little *grounds* of *beer*, which indeed is one of the beſt remedies.

To dye Blue. You muſt firſt boil, beat and rinſe the ſilk, and prepare it while it is white without *alum*; then boil it in the blue ſuds, and wring it out, and dry it, after the ſame manner as you do greens.

BLUE JAPAN. Take gum water, what quantity you pleaſe, and white lead a ſufficient quantity, grind them well upon a porphyry. Then take iſing-glaſs ſize what quantity you pleaſe, of the fineſt and beſt ſmalt a ſufficient quantity, mix them well; to which add of your white lead before ground ſo much as may give it a ſufficient body; mix theſe together to the conſiſtence of paint.

With this mixture do over your work, and repeat this three or four times, till you ſee your *Blue* lies with a good fair body, letting it dry thoroughly between each time; if the blue be too pale, put in more *ſmalt* into the ſize, without any white lead.

Then ruſh it very ſmooth, and go over it again with a ſtronger blue; and when it is thoroughly dry, waſh it twice over with the cleareſt iſing-glaſs ſize alone; then cover it, and let it dry two days.

Then warm the piece gently before the fire, and with a clean pencil, waſh your work over with the fineſt white varniſh, repeating it ſeven or eight times, and then let it dry two days as before; then repeat again the ſecond and third time, your waſhes ſeven or eight times in like manner.

Then let it ſtand to dry for a week, and then poliſh it as before directed; and laſtly to give it a poliſh'd and gloſs'd appearance clear it up with *lamp black and oil.*

You may make the colour either light or deep according to your fancy; if it have but a ſmall proportion of the lead, it will be deep; but if it has a larger, it will be lighter.

Alſo the ſize for laying *blues*, *white*, or any other colour, ought not to be too ſtrong, rather weaker, and juſt ſufficient to bind the colours to make them ſtick on the work; for if it be too ſtiff, it will be apt to crack and fly off; and the reaſo of waſhing twice with clear ſize, is to keep the varniſh fron ſinking into or tarniſhing the colours.

A BLUE *for painting or ſtaining glaſs.* Take of fine whit ſand twelve ounces, *zaffer* and *minium* of each three ounces reduce them to a fine powder in a bell-metal mortar; then pu this powder into a very ſtrong crucible, cover it and lute it well and being dry, calcine over a quick fire for an hour; then tak out the matter, and pound it well in the mortar as before; the to ſixteen ounces of this powder add fourteen ounces of nitr powdered, mix them well together, and put them into the crucible again, cover and lute it, and calcine for two hours in a ver ſtrong fire.

Take it out and grind it as before, then add to it a ſixth par of nitre, and calcine again as before for three hours more then take out the matter with an iron ſpatula red hot, leſt i ſhould ſtick; it being very clammy, and not eaſily emptied.

BLUE of the dyers is one of their ſimple or mother colours which is us'd in the compoſition of others. It is made of woad indigo, and a paſtel brought from *Normandy*, and of the thre the paſtel is eſteem'd the beſt and moſt neceſſary; woad, thoug of leſs force and effect, yet makes a tolerable colour, indig only makes a ſpurious colour; yet it may be us'd along wit paſtel if it be well prepared, and be not mixt in too great a proportion.

Woad, having but little ſubſtance, can neither be us'd alone nor is it capable of correcting the indigo without the aſſiſtance o paſtel.

Some dyers heighten their *blue* by adding *brazile* and othe woods.

The way of brightning *blues* is by paſſing the ſtuff, when dye and well waſh'd through lukewarm water, or which is muc better, by working and fulling the dyed ſtuff with melted ſoap and then ſcouring it well.

BLUES are immediately dyed from the whites, without an other preparation than fulling.

Of dying BLUES.

To dye a Blue *or sky colour.* Take a ſufficient quantity o urine, and four ounces of *indigo*, pound it to powder, and the diſſolve it in the urine by a gentle heat, being cloſe covered then try its ſtrength with a little bit of wool or flannel, an if it does not dye well, let it ſtand longer, until it is of a goo colour.

It will be greeniſh at firſt, but will turn *blue* afterwards; before you put in your wool, yarn, flannel, *&c.* put a pint o yeaſ yeaſt into your liquor, and it will make the dye the better; the leſs *indigo* is put into the liquor, the better sky colour it will be, provided it be not too little.

II. *To dye an excellent* Blue *colour.* Take of ſtale urine a ſufficient quantity, and four ounces of rock *indigo*, ſet them to ſoak in a good heat, till the *indigo* is diſſolv'd; then put to it a pint of ſlack'd lime, and a pint of new yeaſt, mix them well together, and let them ſtand a quarter of an hour very hot; then ſtir it, and enter twenty yards of broad-cloth, and handle it over and over, for the ſpace of half an hour; then cover it up for twelve hours, and then take it out and waſh it. If it is not deep enough, heat the vat and put it in again.

III. *Another way of dying* Blue. Take a ſufficient quantity of boiling water, put into it pot-aſhes, one pound of *indigo*, two ounces of *madder*, four pints of wheat bran; mix them all together and cover it for the ſpace of twelve hours; then open it and put in one pint of woad, ſtir it about very well and cover it up for an hour; after which open it, ſtir it about, ſcum it and then put in your cloth, wool, *&c.*

This will dye about forty pound weight.

IV. *To dye another* Blue *colour.* Take a ſufficient quantity of urine, make it hot, and put into it four ounces of *indigo*, finely powdered, half that quantity of madder, as much ground malt as madder, and a little yeaſt, two ounces of pot-aſhes, cover it up and let it ſtand in the warmth of the fire, and try when it will make a good colour, and if it does, firſt wet the cloth in warm water, and keep the vat warm and work the cloth in it, till it is of a good *Blue*, taking care to ſtir it often that it may not ſpot; keep it thus working till the dye is as deep as you would have it.

V. *To dye another* Blue. Steep *ebulus* or dwarf elder-berries being ripe and well dryed, in vinegar for twelve hours, then rub them with your hands, and ſtrain them through a linen cloth, putting thereto ſome bruis'd verditer and allum.

But take notice, that if you would have the *Blue* to be clear, you muſt put more verditer to it.

VI. *Another* Blue *dye.* Take tincture of braſile a ſufficient quantity, vinegar three ounces, copper ſcales one ounce, ſalt one dram; mix all in a copper veſſel, in which put the matter to be dyed.

VII. *Another ſingular* Blue *dye.* Take of calcin'd tartar three pugils, of unſlack'd lime one pugil, and with a ſufficient quantity of water make a *lixivium*, and filter it; put one pound of *Flanders Blue* to twelve or fifteen quarts of this *lixivium*, and mix them well together; ſet it on the fire till it is ſo hot, that you can ſcarcely endure your hand in it; then having firſt boil'd (what you would dye) in alum water, take it out and dry it; afterwards dip it in hot lye twice or thrice, and put it into the dye again.

VIII. *To make a ſubſtantial* Blue *dye.* Take water a gallon, one pound of woad, infuſe it in a ſcalding or almoſt boiling heat for twenty four hours; then put into it wool, cotton, ſtuffs, flannel, or cloth of a white colour.

IX. *Another good* Blue. Take a ſufficient quantity, heat it in a copper, and diſſolve in it half a pound of indigo, then put it into the vat, and add one ounce of madder, and a little ground malt; let it ſtand a while, and then enter twenty yards of cloth, working it till it is deep enough.

X. *Another fair* Blue. Take *ſal armoniack* and quick lime, of each one pound, and two or three ounces of verditer, put all into a vial, and ſet it in a horſe dunghil for forty days.

XI. *Another fair* Blue *colour.* Infuſe ſome turnſole all night in urine, the next day grind it, and mix it with a little quick lime, according as you would have the colour to be; if you would have it a light ſhining colour, add to it a little gum Arabick.

XII. *To dye barley ſtraw of a* Blue *colour.* Take a ſufficient quantity of *lixivium* of pot-aſhes, and a pound of *litmus* or logwood ground, make a decoction; then put in your ſtraw, and boil it and it will be *blue.*

To make a fine BLUE *ſtaining water.* Make a weak lixivium of pot-aſhes, or take lime water, and put into it a ſufficient quantity of *florey*, and diſſolve a little alum in it, and ſtir it well over the fire; then take it off, and throw wood aſhes into it, and ſo you will have a fine blue.

A weaker BLUE *ſtaining water.* Diſſolve a ſufficient quantity of *blue florey* in a ſufficient quantity of water, and a little alum, and it will be of a fainter colour than the former.

A ſtaining BLUE *water, weaker than the latter.* Take a quart of pure well water, two ſhells of *florey blue*; mix them well together, and lay them on thin. This will be the fainteſt of all the three.

To dye wood, horns, or bones BLUE. Firſt boil them in alum water, then put them into a diſſolution of *indigo* in urine.

To dye briſtles and feathers BLUE. Firſt boil them in alum water, and after, while they are warm, put them them into a tincture of juice of elder berries.

To make German BLUE. Take ſal armoniack two pounds, flowers of ſulphur three quarters of a pound, quick lime half a pound; pound and grind them in an iron or marble mortar, till the mercury is wholly mortified and diſappears; then put it into a glaſs body, well luted up to the middle; ſet it in a very gentle ſand heat uncovered, till all the moiſture is vaniſhed. Stop it cloſe, and increaſe the heat gradually, to make the maſs ſublime; ſo will you have an excellent azure or *Blue*, which grind on a porphyry to a ſubtil powder for uſe in painting.

BLUENESS is the quality of any blue body; or it is ſuch a ſize and texture of the parts, which compoſes the ſurface of a body, as diſpoſes them to reflect the *blue* or azure rays of light, and thoſe only to the eye.

As for the *blueneſs* of the skies, Sir *Iſaac Newton* obſerves, that all the vapours, when they begin to condenſe and coaleſce into natural particles, become firſt of ſuch a bigneſs as to reflect the *azure* rays, before they can conſtitute clouds or any other colour.

This therefore being the firſt colour they begin to reflect, muſt be that of the fineſt and moſt tranſparent skies, in which the vapours are not arriv'd to a groſſneſs ſufficient to reflect other colours.

M. *de la Hire*, and before him *Leonardo de Vinci* obſerves, that any *black* body, view'd thro' a thin *white* one, gives the ſenſation of *blue*; and this he aſſigns as the reaſon of the *blueneſs* of the sky; the immenſe depth whereof being wholly devoid of light, is view'd thro' the air, illuminated, and whitened by the Sun.

For the ſame reaſon, he adds, it is, that ſoot, mixt with a *white*, makes a *blue*; for white bodies being always a little tranſparent, and mixing themſelves with the *black* behind, give the perception of *blue*.

From the ſame principle, he accounts for the *blueneſs* of the veins on the ſurface of the skin, tho' the blood they are fill'd with be a deep red; for he obſerves, that red, unleſs viewed in a ſtrong clear light, appears a dark brown, bordering on black. Being then in a kind of obſcurity, in the veins it muſt have the effect of a black; and this view'd through the membrane of the veins and the white skin, will produce the perception of *blueneſs*.

B. M. VVV. ſignifies *Bernardo Malpucci* of *Mantua*, painter and engraver; he engrav'd in wood with three tools; with the firſt he made the profile, with the ſecond the ſhadows, and with the third the light.

Bol. inventor
Bonaſo ſc. 1545. } ſignifies *Julio Bonaſoni* of *Bologna*.

BOASTING is repreſented by a woman making a great ſhew, covered with peacock's feathers; with a trumpet in her left hand, and her right in the air.

The feathers denote *pride*, the mother of boaſting; the trumpet alſo intimates ſelf-boaſting, or ſounding ones own fame, being blown by ones own breath; for *vain boaſters* take delight in publiſhing their own actions.

BODY as to BEAR a BODY, a term us'd of painting colours, and ſignifies that the colours are of ſuch a nature, as to be capable of being ground ſo fine, and mixing with the oil ſo intirely, as to ſeem only a very thick oil of the ſame colour.

Of this nature are white lead and ceruſs, lamp-black, ivory black, vermilion, lake, pink, yellow oker, verdigreaſe, indigo, umber and *Spaniſh* brown.

Blue bice and red lead are not ſo fine, as they may be ſaid to *bear a very good Body*; but thoſe before mentioned may be ground ſo fine, as to be like even oil itſelf; and then they alſo may be ſaid to work well, ſpreading ſo ſmooth, and covering the body of what you lay it upon ſo intirely, as that no part will remain viſible, where the pencil hath gone, if the colour be work'd ſtiff enough.

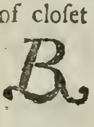
Whereas on the contrary verditers, and ſmalts, with all the grinding poſſible to be given them, will never be well imbodied with the oil, nor work well.

Indeed *bice* and *red-lead* will hardly grind to an oily fineneſs, nor lie intirely ſmooth in the working; yet may be ſaid to *bear an indifferent Body*, becauſe they will cover ſuch work very well that they are laid upon.

But ſuch colours as are ſaid *not to bear a Body*, will readily part with the oil, when laid on the work: ſo that when the colour ſhall be laid on a piece of work, there will be a ſeparation, the colour in ſome parts, and the clear oil in others; except they are tempered extraordinary thick.

EDWARD du BOIS was a hiſtory and landſkip painter, but chiefly the latter, born at *Antwerp*. He was diſciple to one *Groenwegen* a landſkip painter; likewiſe who reſided many years in *England*, and had been ſome time in *Italy*. *Du Bois* alſo travelled to *Italy*, where he continued eight years, during all which time he ſtudied the antiques, and painted after the *Italian* guſto jointly with his brother now living here.

He worked ſome time at *Paris*, and in his way to *Italy*, did ſeveral pieces for *Charles Emanuel* Duke of *Savoy*. Soon after his return to *Holland*, he came to *England*, and died in *London* about thirty three years ago, being ſeventy ſeven years old. He lies buried in St. *Giles*'s church. He and his brother, by their extraordinary induſtry, have made one of the fineſt collections of cloſet pieces eſpecially of any in *England*.



RENE BOIVIN who engrav'd ſeveral plates of antient foliages, us'd this mark.

BOLLITO a name by which the *Italians* call a ſea green colour in artificial cryſtal.

This colour is not to be made without a great deal of precaution.

To ſucceed well, you muſt have in the furnace a pot fill'd with forty pound of good cryſtal frit, carefully ſkimm'd, boil'd and purified, without any *manganeze.*

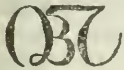
Then you muſt have twelve ounces of the powder of ſmall leaves of copper thrice calcin'd, as directed in the article COPPER. And half an ounce of *zaffer* in powder, prepar'd as directed in the article ZAFFER.

Mix theſe powders together, and put them at four times into the pot, that they may the better mix with the glaſs, ſtirring them well each time of putting in the powder, for fear it ſhould ſwell too much and run over.

After the whole has been incorporated, well mix'd and pretty well ſettled for two hours, try if the colour is deep enough, if ſo, let it reſt, though the ſea green or ſky colour ſeems at firſt greeniſh, you need not be concern'd at it; for the ſalt in the glaſs will conſume all that greenneſs, and change it into blue.

After the metal has ſtood at reſt for twenty four hours, it may be wrought, and you'll have the colour deeper or lighter, according to the quantity of powder you have put into it.

There is no other rule for that but the fancy of the workman, for which reaſon it cannot be aſcertained; beſides, the matter that is us'd for tinging glaſs, makes it have ſome more colour, ſome leſs, which proceeds from the preparation of it.



SCHELDE A BOLSUVERT us'd this mark when he had not a mind to ſubſcribe his name.

Ty dye BONES, HORNS, WOOD, &c.

To dye BONES GREEN. Put of filings of copper and verdegreaſe, of each three ounces, into a quart of white wine vinegar; add a handful of bruiſed rue, mix them well, and put the bones in this for fifteen days.

To dye BONES, HORNS, *or* WOOD *red.* Firſt, let them be boil'd in alum water, then put them into a tincture of brazil in alum water for two or three weeks, or elſe into a tincture of brazil with milk.

To dye them BLUE. Firſt boil them in alum water, then put them into a diſſolution of indigo in urine.

To dye them GREEN *like emeralds.* Put as much filings of copper into *aqua fortis* as it will diſſolve; then put in bones, horns, wood, and let them lie for one night.

To dye ELDER, BOX, MULBERRY, PEAR-TREE, NUT-TREE *of the colour of* EBONY. Steep the woods in alum water for three or four days, then boil it in common oil, with a little *Roman vitriol* and *ſulphur.*

Where you are to take notice, that the longer you boil the wood, the blacker it will be; but too long boiling will make it brittle.

To dye Bones green. Firſt boil the bones in alum water, then take them out, dry them, and ſcrape them; then boil them in lime water, with a little verdegreaſe.

To dye Wood like ebony. Diſtil an *aqua fortis* of ſalt petre and vitriol, and beſmear the wood with it as oft as you ſee occaſion.

To make Horns black. This may be done with vitriol diſſolved in vinegar and ſpirit of wine; or with the ſnow white calx of ſilver in fair water.

To make Bones white. Boil them in water and lime, ſcumming it continually.

To dye Bones black. Take litharge and quick lime of each two pounds, put it into a ſufficient quantity of water; put in the bones, and ſtir them with a ſtick till they boil apace. Then take it off the fire, and keep ſtirring till all is cold, and the bones will be very black.

To ſoften Bones, Ivory, &c. Lay them for twelve hours in *aqua fortis*, then three days in the juice of beets, and they will be tender, and you may make of them what you will. When you would harden them again, lay them in ſtrong white wine vinegar.

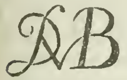
To dye Bone, Ivory, Horn, &c. *black.* Put braſs into *aqua fortis*, and let it ſtand till it is turn'd green, with which waſh the *Bone, Horn,* &c. (it having been firſt poliſhed) three times: then put them into a ſtrong decoction of logwood in fair water whilſt hot, letting them lye a little; which done, ruſh and poliſh it, and it will be as black, and have as good a gloſs as japan or ebony.

To dye Bones, Horn, &c. *of a green colour.* Firſt boil them in alum water, then take wine vinegar what quantity you pleaſe, *Spaniſh* green or common verdegreaſe well ground a ſufficient quantity, ſal armoniac half the quantity of the verdegreaſe; then put in the *Bones,* &c. and keep them gently boiling till they are ſufficiently ſtain'd.

To dye BONES, &c. *of a red.* Mix a ſufficient quantity of quick lime with what quantity of water you pleaſe, let it ſtand a night to diſſolve, then decant off the clear water, ſtraining it through a cloth. Take of this water eight pounds, put into it four ounces of brazil wood raſp'd, mix and boil them gently; (then having firſt boil'd the bones in alum water) put them in, and boil them into the tincture of brazil till they are thoroughly red.

To make a BLACK *of burnt Bones.* Burnt ivory, or for want of that, burnt bones is the blackeſt black; and if you have not the conveniency of burning them in crucibles as is elſewhere directed, put them into the fire till they be thoroughly burnt; then take it out, and let it cool, and ſo ſlit it in the middle, and take out the blackeſt of it in the middle, and grind it for your uſe.

DANIEL BOON was a *Dutch* droll painter, and a great admirer of uglineſs and grimace, both in his ſmall and great pieces; in which he ſeldom forgot to endeavour to raiſe mirth in his countrymen and ours of the ſame ſublime genius. He died lately.



DAVID VAN BOONS *Inv.* and after this mark we read *Oons*; his plates were engraven by *P. Servator, ſc.*

BORAX is a mineral ſalt, us'd in *ſoldering*, *brazing*, and *caſting* gold and other metals.

Borax is of two kinds, *natural* and *artificial*; the *natural* is alſo call'd crude, the artificial is that which is purified and refin'd.

The *natural Borax* is a mineral ſalt of the common form, dug out of the earth in ſeveral parts of *Perſia*; and is found alſo at the bottom of a torrent, running in the mountains of *Purbeth*, near the frontiers of *White Tartary.* When it is taken up it is expos'd to the air, where it acquires a kind of reddiſh fat, which ſerves to feed it, and prevent its calcining.

When it is in its perfection, it is ſent to *Amadabat* in the territories of the great *Mogul*, where the *European* merchants buy it.

There is another kind of artificial *Borax*, drier and of a greyiſh colour, like *Engliſh copperas*, only differing from the former by its being longer expos'd to the air.

The *Venetians* were the firſt who found out the art of preparing artificial *Borax*, or rather of purifying the natural. The method of doing it is by diſſolving it in water, then filtrating and cryſtallizing it; uſing for that purpoſe matches of cotton, about which the *Borax* cryſtallizes, like ſugar candy and verdegreaſe on wood.

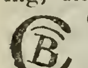
The *Dutch*, after they have refined it, reduce it into little pieces, like tagged points, and 'tis thus 'tis commonly uſed.

Borax refined, either after the *Venetian* or *Dutch* manner, ſhould be clear and tranſparent, almoſt inſipid to the taſte; and above all, care muſt be taken that it have no mixture of *Engliſh* alum.

PARIS BORDONE, born in the year 1512, or 1526, ſcholar of *Titian*, imitated *Giorgione*, liv'd at *Venice* and in *France*; excell'd in hiſtory and portraits, died aged ſeventy five years.

BOREAS, the north wind, is repreſented in painting like an old man with a horrible or terrible look; his hair and beard covered with ſnow, or the hoar-froſt, with the feet and tail of a ſerpent.

FRANCIS BOROMEO *da* SAVIGNANO, born in the year 1446, ſcholar to *Coſimo Roſſelli*, and ſtudied *Leonardo da Vinci*, liv'd at *Florence*. Excell'd in portraits and hiſtory painting, died in the year 1517, aged forty eight years.



CORNELIUS BOSS, on a virgin engraven by him is this mark, and underneath *Michael Ang. inv.* i. e. *Buonaroti.*

BOUNTY is repreſented emblematically by a noble lady, cloath'd in a garment of sky colour, ſtanding by an altar enflam'd, preſſing the milk out of her breaſts with both hands plentifully, of which ſeveral animals drink, and ſome upon the kindled altar. The ſqueezing of her breaſts alludes to the bountifulneſs of her diſpoſition, and ſome of it falling upon the flames of the altar, denote that *Bounty* ought to be ſhewn in imitation of God himſelf.

SEBASTIAN BOURDON, born in the year 1619, ſtudied in *Rome*, liv'd at *Rome*, *Sweden*, and *Paris*; excell'd in hiſtory and portraits, died in the year 1690, aged ſeventy years.

B. P. ſignifies *Bartholomew Paſſorotto* of *Bononia*, a painter.

To make BRAN-WATER *for preparing ſlight ſtuffs for dying.* Put a hatfull of wheaten *Bran* into each pail of water, and boil them together for a quarter of an hour, then pour it into a clean tub, where to every two pailfulls of this liquor, pour in another pail of water, and throw on a handful of *leven*. The *French* dyers call theſe waters *eaux ſures*, *i. e.* acid or ſharp waters, and by how much they are the ſowrer, account them ſo much the better, and fitter to attract the fatneſs of the ſtuffs, and dry it clean off, to make them limber, and correct the roughneſs of the water.

Cavalier GIACINTO BRANDI, born in the year 1623, a ſcholar of *Lanfranc*, liv'd in *Rome*, excell'd in hiſtory, died in the year 1691, aged ſixty eight years.

BRASIL } a wood ſo call'd, becauſe firſt brought from *Bra-*
BRAZIL } *zil*, a province of *South America*. It has various names, according to the places it comes from. Thus we have *Brazil* of *Fernambouc*, *Braſil* of *Japan*, of *Lumon*, of *St. Martha*; and laſtly *Braſilette*, brought from the *Antilles*.

The *Brazil*-tree commonly grows in dry, barren places, and in the middle of rocks; it is very thick and large, and uſually crooked and knotty. Its flowers, which are of a beautiful red, exhale a very agreeable ſcent, good for comforting and ſtrengthening the brain.

Though the tree be very thick, it is covered with ſo thick a bark, that when the ſavages have taken it off the wood, a trunk, which was before the thickneſs of a man, is ſcarce equal to that of his leg.

Braſil wood is very heavy, dry, crackles much in the fire, and ſcarce raiſes any ſmoke, by reaſon of its extreme dryneſs.

None of the ſeveral kinds have any pith, except that of *Japan.* That of *Fernambouc* is eſteem'd the beſt.

It muſt be choſen in thick pieces, cloſe, ſound without any bark; and ſuch as upon being ſplit from pale, becomes reddiſh; and being chewed, has a ſugary taſte.

It is much us'd in dying, where it ſerves for a red colour, but it gives but a ſpurious colour, and eaſily evaporates and fades; nor is the wood to be us'd without alum and tartar. From the *Brazil* of *Fernambouc* is drawn a kind of *Carmine* by means of acids.

There is alſo a liquid *lacca* made of it for painting in *miniature.*

To make LAKE *or Tincture of* BRAZILE. The *Brazile* meant here is that which the dyers make uſe of. Take of the fineſt that comes from *Fernambouck*, that being the beſt.

The way of extracting this tincture is the ſame as that from *Kermes* (ſee KERMES) and may be effected two ways, either with the *menſtruum* firſt preſcrib'd, or with ſtrong waters; only obſerve not to put ſo much *alum* to each ounce of *Brazile* as to the berries; for that tincture is deeper than this from *Brazile*, and conſequently requires more ſtuff; therefore uſe only in this as much as you think reaſonable, experience will be the beſt guide.

Take notice too, that when you do it by the firſt *menſtruum*, there is a greater quantity required of *Brazile* than was preſcrib'd of *Kermes-berries*, to each pound of ſhearings.

In every thing elſe follow the former directions, and you'll have a fine colour or lake leſs chargeable, and altogether as good as the tincture of *Kermes*, for painting.

BRASS, or as the *French* call it, *yellow copper*, is a factitious metal made of copper and *lapis calaminaris.*

The method of preparing it is as follows. The *lapis* having been calcin'd, and ground fine as flour, is mix'd with ground charcoal; and incorporated, by means of water, into a maſs: this being done, about ſeven pounds of the *lapis calaminaris* is put into a melting-pot that will contain about a gallon; and over that about five pounds of *copper*; this pot is let down into a wind-furnace eight foot deep, where it remains for eleven hours, in which time it is converted into *braſs*.

This metal then is caſt either into plates or lumps; forty five pounds of crude *lapis calaminaris* or calamine, will produce thirty pounds when calcin'd or burnt.

Sometimes *braſs-ſhruff* is us'd inſtead of copper; but that is not always to be procur'd in quantities ſufficient, it being no other than a collection of old braſs.

Pure braſs is not malleable, unleſs when it is hot; for when it is cold, it will break. And after it has been melted twice, it will be no longer in a condition to bear the hammer at all; but in order to render it capable of being wrought, they put ſeven pounds of lead to a hundred pounds of braſs, which renders it more ſoft and pliable.

The beſt proportion for gun-metal for caſting great guns is ſaid to be a thouſand pounds of *copper*, nine hundred pounds of *tin*, and ſix hundred pounds of *braſs* in eleven or twelve thouſand weight of metal.

The beſt braſs guns are made of malleable metal, not of pure copper and calamine alone; but coarſer metals are us'd to make it run cloſer and ſounder, as lead and pot-metal, which laſt is made of braſs and lead; twenty pound of lead is uſually put into a hundred pounds of pot metal.

Corinthian BRASS has been famous in antiquity, and is a mixture of gold, ſilver, and copper. *L. Mummius* having ſack'd and burnt the city of *Corinth*, 146 years before our Saviour's time, there being there a vaſt number of ſtatues, images, veſſels, *&c.* of gold, ſilver, and copper, all theſe melted and run together by means of the violence of the conflagration; and this mixture was the compoſition call'd *Corinthian braſs*. Thoſe who ſpeak of it accurately, diſtinguiſh it into three kinds; in the firſt, gold is the prevailing metal; in the ſecond, ſilver; in the third, gold, ſilver, and copper are equally blended.

To make BRASS. Melt ſix pounds of copper with two pounds of *lapis calaminaris* in powder for the ſpace of an hour, and then put it out.

To cleanſe BRASS. Take *aqua fortis* and *water*, of each a like quantity; ſhake them together, and with a woollen rag dipt therein, rub it over; then preſently rub it with an oily cloth: laſtly, with a dry woollen cloth, dipt in *lapis calaminaris*, and it will be as clear and bright as when new.

To purge BRASS. It is cleanſed or purged by caſting into it while it is melted, broken glaſs, tartar, ſal armoniack and ſalt petre, each of them by turns, a little and a little.

To calcine BRASS, *call'd* Orpello *or* Tremolante, *making a curious ſea-green or ſky-colour*. Take thin Braſs, cut it into ſmall pieces, put it into a crucible covered and luted at top; ſet it in a fierce fire, where let it ſtand four days in a great (but not melting) fire, for if it melt, your labour is loſt. In four days time it will be very well calcin'd; then powder'd as fine as you poſſibly can, ſearſe it, and the powder will be black; ſpread this on tiles, and keep a leer on burning coals for four days, near to the round hole; take away the aſhes that fall upon it, powder and ſearſe it again, and then keep it cloſe ſtopt for uſe.

To know if it be well calcin'd, put it into glaſs, and if it ſwells, 'tis right; if not, it is not well calcin'd, or elſe it is over burnt, and if ſo, it will not give a good colour.

To calcine BRASS *another way, to make a tranſparent* RED. Cut your thin pieces of braſs ſmall, and put it into a melting pot, with layers of powder of *brimſtone*, and metal as in copper. Set it firſt on kindled coals, then put it into a ſtrong fire in the furnace to calcine for twenty four hours; then beat it to a fine powder, and ſearſe it; put it covered into the furnace on earthen tiles for twelve days, to reverberate; ſo powder, grind, and keep it for uſe.

Beſides a *red*, it contributes principally to the making a yellow and *chalcedony*.

A RED *colour from* BRASS. Put ſmall pieces of it into the arches of the furnace, and let them remain there cloſe till they are well calcin'd; but in ſuch a fire, that they may not melt; and when they are well calcin'd, powder the braſs, and the powder will be red, and excellent in many uſes for colouring glaſs.

Braſs thrice calcin'd is likewiſe very excellent.

To calcine BRASS *thrice.* Put this into the *leer*, or into the *furnello* of the furnace, near the *occhio*, into pans baked or earthen tiles; calcine it for four days, and you will have a *black powder* ſticking together; pound it fine, and ſearſe it; then calcine it again as before, but a day longer, and then it will not ſtick together, and will be of a *ruſſet* colour; and do ſo the third time, but take care that it be not calcin'd either too much or too little, for then it will not give a good colour.

To know if it be well calcin'd, put it to purified metal, and it will make it boil and ſwell; and if it does not, it is either too much or too little.

This makes a curious *ſea-green*, and an *emerald-green*, a *turquois* or *ſky colour*, and other varieties.

BRASS *to tinge of a gold colour.* Diſſolve burnt braſs in *aqua fortis* (made of *vitriol*, *ſalt-petre*, *alum*, *verdigreaſe* and *vermilion*) and then reduce it again, and it will be much of a gold colour.

To make BRASS *thorough white.* Heat braſs red hot, and quench it in water diſtill'd from *ſal armoniack* and egg ſhells ground together, and it will be very white.

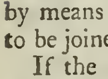
Another way. Calcine egg-ſhells in a crucible, and temper them with the whites of eggs; let it ſtand ſo three weeks; heat the braſs red hot, and put this upon it.

The way to colour BRASS *white.* Diſſolve two penny weight of ſilver in *aqua fortis*, ſetting it to the fire in a veſſel till the ſilver turn to water; to which add as much powder of *white tartar* as may drink up all the water, make it into balls, with which rub any braſs, and it will be as white as ſilver.

BRAZING is the ſoldering or joining two pieces of iron, *&c.* by means of thin plates of braſs, melted between the two pieces to be joined.

If the work be very fine, as when the two leaves of broken ſaws are to be brazed or join'd together again, it is covered with powdered *Borax* moiſtened with water, that may incorporate with the *braſs-duſt*, which is added to it, and the piece is expos'd to the fire, without touching the coals, till the braſs be obſerv'd to run.

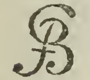
But to *braze* with a ſtill greater degree of delicacy, a ſolder is made of braſs with a tenth part of *tin*; or another, one third braſs and two thirds ſilver; or *borax* and *roſin.* But in all theſe manners of *brazing*, care muſt be taken that the pieces be join'd cloſe throughout; the ſolder only holding in thoſe places which touch.



HANS BRESANK engrav'd the ſtories of the New Teſtament, and in the year 1619, the twelve Apoſtles, our Saviour, and St. *Paul.* He uſed this mark.

MATTHEW BRILL, born in the year 1550, liv'd at *Antwerp* and *Rome*, excell'd in hiſtory and landſcapes, died in the year 1684, at thirty four years of age.

PAUL BRILL, born in the year 1554, imitated his brother *Matthew*, afterwards ſtudied *Annibal Carrache*, and copied *Titian*, liv'd at *Rome*, excell'd in landſcapes and hiſtory.



I. G. BRONCHORTS in certain landſcapes uſed this mark, in which we likewiſe find the letters C. P. *i. e. Cornelius Pulemburgh, pinxit.*

To extract Lake from BROOM FLOWERS. Firſt make a *lixivium*, or *lye* of *ſoda* of the glaſs houſe, and freſh quick lime, which muſt be pretty ſtrong, in which put in the *broom-flowers*, over a ſmall fire, until all the tincture be drawn from them, the flowers become white, and the *lye* receive the yellow colour.

Then take out the flowers, and put the lye into a glaz'd earthen veſſel to boil, adding thereto as much *roch-alum* as it can well diſſolve; then take it off, and putting it into a large veſſel, mix it with fair water, ſo the yellow will ſeparate and deſcend to the bottom; let it reſt there a little, and aftervards decant the water off gently, and ſo put in more freſh to t again and again, until the water has drawn off all the *ſalt* and *lum* from the *lixivium*, and it becomes clear.

Thus the colour will be very well cleans'd of the *ſalt* and *lum*, and remain exceeding fine and bright; ſpread it on pieces f white linen, and let it dry in the ſhade on new baked tiles, nd you will have a moſt admirable *yellow* for painting.

ADRIAN BROWER, born in the year 1608, a ſcholar of *Frans Halls*, liv'd at *Antwerp*, excellent at boors and drolls, died n 1638, aged thirty years.

Spaniſh BROWN is a dark, dull red, of a horſe fleſh colour. It is an earth, and is dug out of the ground; but there is ſome of it of a colour pleaſant enough to the eye, conſidering the deepneſs of it

It is of great uſe among painters, being generally us'd as the firſt and priming colour, that they lay on upon any kind of timber work in houſe painting, *&c.* it being a colour that is cheap and plentiful, and works well, if it be ground fine; which may be done with much leſs labour than ſome better colours require.

That which is of the deepeſt colour is the beſt, and that which is the freeſt from ſtones.

Tho' the other ſorts do not give ſo good a colour to the eye, yet they ſerve as well as any others for a priming colour, for the ſeaſoning of the wood in order to lay other colours on.

Tho' this is a dirty brown colour, yet of great uſe, not to colour any garment with, unleſs it be an old man's gown; but to ſhadow vermilion, or to lay upon any dark ground behind a picture, or to ſhadow yellow berries in the darkeſt places, when you want lake, *&c.*

It is the beſt and brighteſt colour when it is burnt in the fire till it be red hot, tho' if you would colour any hare, horſe, dog, or the like, it ſhould not be burnt; but for other uſes, it is beſt when it is burnt. As for inſtance, for colouring wood, poſts, bodies of trees, or any thing elſe of wood, or any dark ground of a picture.

Obſervations on BROWN *Colours.*

Spaniſh Brown is a dirty brown colour, but of great uſe; as alſo to ſhadow *vermilion*, or lay upon a dark ground behind a picture. You may ſhadow yellow berries with it in the darkeſt places, when you want *lake* or thick *red-ink*; but don't colour garments with it, unleſs it be old mens gowns.

Umber is a hair colour, and the beſt and brighteſt when it is calcin'd red hot; but it muſt not be burnt for colouring any hare, horſe, dog, *&c.* but for other uſes, it is beſt calcin'd or burnt; as for colouring poſts, bodies of trees, timber-work, or any dark ground in a picture, Uſe it not in garments, unleſs in old mens gowns or ca ſtanding together, which are not to be all of the ſame colou But for diſtinction's or variety's ſake, you may uſe it unburnt i many caſes.

I. *The method of dying* BROWNS. Take a ſufficient quantity of water, put it into the copper, and put of red-woo ground and nut galls bruis'd, of each twenty ounces; boil then together, and enter twenty yards of broad-cloth, boiling it fo two hours and a half, and keep cooling it with a cooler, for fea of ſpotting; then take it up and air it: then put in ſixteen ounces of copperas, and enter the cloth again, when it is almoſ ready to boil again, and handle it, letting it boil half an hour. and then cool it. If you would have the colour ſadder, put in more copperas.

II. *To dye a ſad* BROWN. Firſt, infuſe the cloth or ſtuf to be dyed in a ſtrong tincture of *hermodactyls*; then put ſaffron and aſhes in a bag *ſtratum ſuper ſtratum*, upon which put water two parts, mixed with vinegar one part; ſtrain out the water and vinegar, being thoroughly hot, fifteen or ſixteen times. In this lixiviate tincture of ſaffron, put the former matter to be dyed, letting it lie a night; then take it out, and without wringing, hang it up to dry; repeat this working the ſecond and third times.

III. *To dye a* BROWN *tawny, or iron ruſt colour.* Make a ſtrong decoction of walnut-tree leaves in fair water; then put in the matter you would have dyed, and boil it ſome hours with the leaves in the ſaid liquor, and when it comes out, it will be exactly of a tawny brown colour.

IV. *To make the colour call'd the* London BROWN. Firſt dye twenty yards of cloth of a bright blue; then take ſtale, clear liquor made of wheat bran a ſufficient quantity, a quarter of a pound of ground logwood, and of alum two pound and a half; mix and boil the cloth two hours and a half, and then cool it; afterwards take freſh liquor made of wheat bran and clear, to which put two pounds and a half of madder, and handle the cloth; let it have a quick fire to a boiling, then cool it; after which, take a ſufficient quantity of fair water, half a pound of logwood, a quarter of a pound of braſil ground; then let them boil well, adding ſome urine; then enter the cloth, and handle it, and let it boil a quarter of an hour; cool it and waſh it well.

V. *To dye woollen a clove* BROWN. Boil three pounds of *alum*, and two pounds of *tartar* in a copper; then put in the ſtuff, boil it two hours; then take it out, and put in together five pound of *madder*, and a pint of wheat-bran, ſtirring the liquor three quarters of an hour, till it is boiling hot; then draw off the waer, putting in freſh water, and put in a pound of galls and the loth, which boil for an hour; then take it out again, and put hree pounds of *copperas* into the kettle, and then put in the ſtuff gain, and ſtir it about till it is ſufficiently dyed; then rinſe it.

VI. *Another clove* BROWN. Heat ſome water with clear ne flour, and for every pound of ſtuff, put in two ounces of *lum*, one ounce of tartar in powder; boil them together, then ut in the ſtuff, and ſtir it about for an hour; then cool and inſe it; then heat ſome fair water, and for every pound of ſtuff, ake two ounces of *braſile*; boil it for half an hour, then put he rinſed ſtuff into it, and work it ſo long, till it is ſufficiently nged red; then take it out, and add to the dye an ounce of *itriol*; diſſolve it very well, then work the ſtuffs ſo long in it s you ſhall judge proper; then rinſe it out.

VII. *Another* BROWN *colour.* Take as much water as will over twenty eight pounds of wool, yarn, flannel or cloth; put t into a copper, to which put nut-galls bruis'd ſmall two pounds, ed-wood ground half a pound; then put in the matter to be yed, let all boil together for three hours; then take out the oth and air it; then put into the ſame liquor four pounds of opperas, let it melt; then enter the wool, cloth, *&c.* again, nd boil it to deepen the colour to what degree you would ave it.

VIII. *Another* London BROWN. To a ſufficient quantity f water, put a pound of nut-galls bruis'd, red wood ground, madder and fuſtic of each half a pound; boil all together for n hour; then put in your cloth or other matter to be dyed, nd let it boil an hour alſo; afterwards take it out and cool it; hen put in two pounds of copperas, and when it is melted, ut in the cloth again, and ſadden it. This will dye twenty ound weight.

IX. *Another kind of* BROWN. Put a pound of nut-galls ruis'd ſmall, two pounds and a half of red wood bruis'd to a ufficient quantity of water; let them boil for two hours; enter venty yards of broad cloth, and ſadden it at your pleaſure.

X. *Another* London BROWN. To a pound and a half of ed-wood ground, put a ſufficient quantity of water, into which nter twenty yards of broad cloth; boil all together for an hour; ake it forth and cool it, and put into the liquor wood-ſoot a fficient quantity; and let the copper boil till the wood is diſlv'd; then put in the cloth, and boil it for an hour; take out he cloth and cool it; put in copperas a ſufficient quantity; put the cloth again, and ſadden it as uſual.

XI. *Another* BROWN *colour.* Put two pounds of madder, nd a pound and a half of nut galls bruis'd, and three quarters of pound of fuſtick, into a ſufficient quantity of water; let them boil, and then put in fifty pounds of wool, yarn, flannel or cloth; let it boil for two hours and a half; then cool it, and put in copperas two pounds, and boil to a ſadneſs deſign'd.

XII. *To dye a laſting and neat purple* BROWN. Firſt dye cloth (for ſlight ſtuffs will not bear the price of this dye) a blue, either light or dark, according as you would have the colour; then boil it firſt either with *galls* and *madder*, or with *galls* only; and after that with *copperas*.

When it has been well boil'd with *madder*, or with *copperas* and *madder*, or with *galls* alone, if it be perfectly finiſh'd, it will not take any ſtain from *wine*, *vinegar*, or *urine*.

On the contrary, all colours dyed with wood; as for example, the *red* or the *blue*, in which *braſile* has been us'd, will take ſtains from the weakeſt acids, which will cauſe in them a very viſible change.

Indeed *yellow wood* is a ſort of exception to this general rule, for its dye does not change ſo ſoon.

XIII. *To dye barley ſtraw*, &c. BROWN. Take a ſufficient quantity of *lixivium*, *Indian* wood ground, green ſhells of wallnuts, of each half a pound; let the ſtraw ſteep four or five days in a gentle heat, and then take them out.

XIV. *To dye or ſtain wood of a walnut tree* BROWN. Take the green ſhells of wallnuts, dry them in the ſun, and boil them in nut oil; and rub the wood with this oil.

JAN BRUEGHEL, *the ſon of old* Peter, *call'd* PLUWEELEN, *or velvet* BRUEGHEL, born in 1569, a ſcholar of *Peter Goe-kint*, ſtudied in *Italy*, liv'd at *Bruſſels*, excell'd in wakes, fairs, dances, landſcapes, *&c.* and in little, died in the year 1625, aged fifty ſix years.

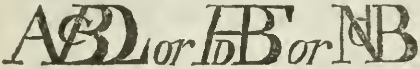
A. D. BRUIN, born in 1560. He engraved ſix of the twelve *Cæſars*, and various ovals in 1579, and uſed the firſt of the marks of *Nicholas de Bruyn*.

BRUSHES. In the choice of *bruſhes* and *pencils* obſerve the following directions.

For *bruſhes*, obſerve whether the briſtles are faſt bound in the ſtocks, and if the hair be ſtrong and lye cloſe together; for if they do not lye cloſe, but ſprawl abroad, ſuch will never work well; and if they are not faſt bound in the ſtock, the briſtles will come out when you are uſing them, and ſpoil your work; as may be ſeen where the looſe hairs of the bruſh have lain up and down in the colours laid on, to the great diſparagement of the work.

To prevent this, if they are not faſt bound, drive in ſome thin wooden wedges, between the thread with which they are bound round, and this will render the briſtles tight and ſecure.

WIRE BRUSHES are of uſe for ſcrubbing thoſe ſilver, copper, and braſs pieces which are to be gilded over, thereby perfectly to free them from any dirt, ruſt, or filth which may adhere to them; which not being taken off, would hinder the cloſing of the gold with them. They are therefore us'd by gilders, ſilverſmiths, *&c.* and are uſually ſold by iron-mongers.



NICHOLAS DE BRUYN. He uſed three marks at different times.

Charles le BRUN, was born at *Paris*, *anno* 1620. and he began his ſtudies under *Simon Voüet*, and finiſhed at *Rome* by the favour of Monſieur the Chancellor *Sequier*, who ſent him thither with a conſiderable penſion for three years; the firſt proofs of his abilities after he returned home, were the prize pieces he made two years ſucceſsfully for the church of *Notre Dame*; and his performances ſoon afterwards in ſeveral of the fine houſes in *France*, gave ſuch a luſtre to his pencil, that the King (upon the recommendation of Monſieur *Colbert*) made him his chief painter, ennobled him, honour'd him with the order of St. *Michael.* He had a genius lively, penetrating, and equal to every thing he undertook; his invention was eaſy, and his talent (excepting in landſcapes only) univerſal.

He was not indeed admired for his colouring, nor for his skill in the diſtribution of his lights and ſhadows; but for a good guſto of deſign, an excellent choice of attitudes, an agreeable management of his draperies, a beautiful and juſt expreſſion, and withal a ſtrict obſervance of the decorum of his compoſitions, will command attention and admiration of the niceſt judges.

His capital works are the cieling of the gallery, and grand ſtair-caſe of *Verſailles*, and his five large pieces, containing the hiſtory of *Alexander* the Great, the prints of which are alone enough to render his name famous to poſterity. He had the ſuperintendency of the manufactures at the *Gobelines*, and for ſome years, governed all the Kings artificers. He died in *France anno* 1690. *ætat.* 70.

B. S. ſignifies *Bartholomew Skenius*, or *Bononenſis ſculptor*.

JOSEPH BUCKSHORN was a *Dutch* painter, born at the *Hague*, who came over to *England* about the year 1670. He was eſpecially eminent for his copies after Sir *Peter Lely*, whoſe manner he came ſo near, that ſeveral heads of his have been taken by good judges for that great maſter's.

He copied alſo *Van Dyck*, and the preſent Lord *Rockingham* has the picture of the Earl of *Strafford* done by him after that great painter. He was Sir *Peter Lely*'s drapery painter for many ny years, and died in *London* at the age of thirty five, and lies buried in St. *Martin*'s Church.

BUILDINGS, as TOWNS, CASTLES, RUINS, *&c.* are painted as follows. 1. Thoſe towns or cities which ſeem to be far off, muſt have but little ſhadowing or heightening, and ſometimes none at all; theſe, if they appear againſt the sky, muſt be laid with *Bice* and a little purple, and ſhaded faintly with a good *blue.*

2. Thoſe which are ſituated ſomething farther diſtant, muſt be laid with *blue* and purple as aforeſaid, and ſhaded with light *blue*, and heightened with *white.*

3. Thoſe which appear at an ordinary diſtance, muſt be laid with *vermilion* and *purple*, and ſhaded with a ſtrong *purple*, ſhaded with white.

4. Thoſe which are near, muſt be done with *vermilion* and *white*, and ſhaded with a ſtrong *vermilion*, and brown *oaker*, mixt with white.

STONE BUILDING [*to paint in miniature.*] Do it with *indigo*, *biſtre*, and *white*, for the dead colouring or ground; and then ſhade with leſs of this laſt, and more of the *biſtre* and *indigo*, according to the colour you would have the ſtones to be; you may, if you pleaſe, add a little oker, both to begin with and to finiſh.

But to add ſtill to its beauty, you ſhould here and there, eſpecially for ruins, make teints of *blue* and *yellow*; the former of *oaker*, and the latter of *ultramarine*, always mixing them with *white*, whether for the firſt ground, provided they appear thro' what you lay upon them, or whether you uſe them at laſt, finiſhing and blending them with the reſt.

WOODEN BUILDINGS, as they are of different kinds, they are left to diſcretion; but the moſt uſual way is to begin with a mixture of *oaker*, *biſtre* and *white*; and finiſh without *white*, or with but very little; and when the ſhades require ſtrengthen with *biſtre* alone.

For others, you may add ſometimes *vermilion*, or ſometimes green or black; in a word, according to what you intend, you muſt mix your colour, and finiſh with ſtippling, as for draperies and all the reſt.

BURNING of COLOURS. There are ſeveral colours that require burning; as firſt *lamp black*, which is a colour of ſo greaſy a nature, that except it is burnt, it will require a long time to dry.

The method of *burning*, or rather *drying lamp-black*, is as follows: put it into an iron ladle or a crucible, and ſet it over a clear fire, letting it remain till it be red hot, or ſo near it, that there is no manner of ſmoke ariſes from it.

Secondly, *umber*, which if it be intended for colour for an horſe, or to be a ſhadow for gold, then burning fits it for that purpoſe.

In order to *burn umber*, you muſt put it into the naked fire in large lumps, and not take it out till it is thoroughly red hot; if you have a mind to be more curious, you may put it in a crucible, and then put it into the fire, till it be red hot; then take it out, and when it is cold, lay it up for uſe.

Ivory alſo muſt be burnt to make a black, thus: fill two crucibles with ſhavings of ivory; then clap their two mouths together, and bind them faſt with an iron wire, and lute the joints cloſe with clay, ſalt, and horſe-dung well beaten together; then ſet it in a fire, covering it all over with coals, and let it remain in the fire, till you are ſure the matter incloſed in the crucibles is thoroughly red hot; then take it out of the fire, but do not open the crucibles, till they are perfectly cold; for if you ſhould open them while hot, the matter would turn to aſhes; and ſo it will be, if the joints are not luted cloſe; for it is only the excluſion of all air, that prevents any matter whatever that's burnt to a coal, from turning to a white aſh, and preſerves the blackneſs.

BURNING GLASSES. A machine by which the ſun's rays are collected into a point; and by that means their force and effects heightened to that extreme degree, as to burn objects plac'd in them.

They are of two kinds, either *convex* or *concave*; the *convex* tranſmit the rays of light, and in their paſſage refract or incline them towards its axis; having the property of *Lens's*, and acting according to the laws of refraction. See LENS and REFRACTION.

The *concave*, which are the more uſual, are very improperly call'd *Burning Glaſſes*, in that they are uſually made of metal; theſe reflect the rays of light, and in that reflection, incline them to a point in their axes; having the properties of *mirrours*, and acting according to the laws of reflection. See MIRROUR and REFLECTION.

Every concave mirrour or *ſpeculum*, collects in rays diſpers'd thro' its whole concavity, after reflection into a point or *focus*, and is therefore a *burning mirrour*.

Hence, as the *focus* is there, where the rays are moſt cloſely contracted, if it be a ſegment of a large ſphere, its breadth muſt not ſubtend an arch above eighteen degrees; if it be a ſegment of a ſmaller ſphere, its breadth may be thirty degrees.

M. *Kircher* is of opinion, that thoſe *Burning Mirrours*, which do not in their breadth ſubtend an arch of more than eighteen degrees, are the beſt of all others.

As the ſurface of a *mirrour*, which is a ſegment of a larger ſphere, receives more rays than another of a leſs; if the breadth of each ſubtend an arch of eighteen degrees, or even more or leſs, provided it be equal, the effects of the larger mirrour will be greater than thoſe of the leſſer.

And as the *focus* is contained between the fourth and fifth part of the diameter, *mirrours* that are ſegments of greater ſpheres will burn at a greater diſtance, than thoſe which are ſegments of a leſſer.

And ſince the *burning* depends upon the uniting or union of the rays on the concave, ſpherical figure; it is not to be admired at, that even wooden *mirrours* gilded, or ſuch as are prepar'd of alabaſter, *&c.* covered with gold, nay even ſuch as are made of paper, and covered with ſtraw, ſhould be found to burn.

Mr. *Tſchirnhaus*'s mirrour, the breadth of which is near three *Leipſick* ells, and its focus two ells diſtant from it, was made of *copper*, and its ſubſtance not more than double the thickneſs of the back of a knife, according to the account in the *acta eruditorum*, perform'd as follows:

1. It ſet fire to green wood inſtantaneouſly, ſo as not to be extinguiſh'd by a ſtrong wind.

2. It boil'd water immediately, and eggs in it were rendered eatable preſently.

3. It cauſed a mixture of *tin* and *lead* three inches thick to drop preſently; and an iron or ſteel plate became red hot preſently, and a little while after burnt holes thro' it.

4. It rendred things not capable of melting ſoon red hot like iron; ſuch as *ſtones*, *bricks*, &c.

5. It rendred *ſlate*, firſt a white and then a black glaſs.

6. It converted *tiles* into a yellow glaſs, and ſhells into a blackiſh yellow one.

7. It melted a *pumice-ſtone* thrown out of a *volcano* into a white glaſs.

8. It vitrified a piece of a crucible in eight minutes.

9. It quickly turn'd *Bones* into an opake glaſs, and earth into a black one.

Dr. *Harris* and Dr. *Deſaguliers* inform us, that they found the following effects perform'd by a *Burning Glaſs* or *Mirrour*, made of a compoſition of *tin*, *copper*, and *tin-glaſs*, in width forty ſeven inches; ground to a ſphere of ſeventy ſix inches radius. So that its *focus* was about thirty eight inches from the vertex.

1. It melted a *ſilver* ſix-pence in 7″ ½.

2. A King *George* the I's half-penny in 16″, and made it run with a hole in 34.

3. It melted *tin* in 3″, caſt iron in 16″, ſlate in 3″.

4. It calcin'd a foſſile ſhilling in 7″.

5. It vitrified a piece of *Pompey*'s pillar at *Alexandria* in the black part in 50″, in the white in 54″, copper *oar* in 8″; calcin'd bones in 4″, and vitrified them in 33.

6. It melted an *emerald* into a ſubſtance like a *turquois* ſtone; and diminiſh'd $\frac{7}{8}$ of the weight of a diamond that weigh'd four grains; vitrified *asbeſtos*, as it would do all other bodies, if they were kept long enough in the *focus*; which when they are once vitrified, the mirror can go no further with them.

BURNISHING is the art of ſmoothing or poliſhing a body by a violent rubbing it with any thing.

Thus book-binders *burniſh* the edges of their books by rubbing them with a *dog's tooth*.

Gold and ſilver are burniſh'd with a *wolf's tooth*, a *dog's tooth*, the *bloody-ſtone*, *tripoli*, a piece of white wood and *emery*.

Hence a *Burniſher* is a round poliſh'd piece of ſteel, ſerving to ſmooth, and give a luſtre to metals.

BUST }
BUSTO } [in ſculpture, &c.] a term us'd for the portrait or figure of a perſon in *relievo*; ſhewing only the head, ſhoulders and ſtomach, the arms being lopp'd off, uſually plac'd on a pedeſtal or conſole.

M. *Felibien* obſerves, that tho' in painting one may ſay a figure appears in *Buſto*; yet it is not properly call'd a *Buſt*, that word being confin'd to things in *relievo*.

The Buſt is the ſame that the *Latins* call'd *Herma*, from the *Greek Hermes*, *Mercury*; the image of that god being frequently repreſented in this manner by the *Athenians*.

BUST is alſo us'd, eſpecially by the *Italians*, for the trunk of an human body, from the neck to the hips.

Menage derives it from the word buſque, a piece of wood, ivory, or whalebone, or the like, which women apply to their ſtomachs, to keep themſelves ſtreight, which the *Italians* call *buſto*.

BUSTLER was a *Dutchman*, both a hiſtory and face painter in the reign of King *Charles* II. There is a good picture, partly performed by him, in Mr. *Elſum*'s poſſeſſion of the *Temple*, which conſiſts of three boors playing together in different actions by Mr. *Buſtler*, a good landſkip behind by Mr. *Lanckrinck*, and a little dog on one ſide by *Hondius*.

How to take the IMPRESSION *of any* BUTTERFLY *in a minute in all colours.* Kill the butterfly, but take care not to injure the wings, but ſpread them open in a flying manner as exactly as may be; then take a piece of white paper, and with a ſmall bruſh or pencil, waſh a part of the paper with gum-water, a little thicker than ordinary; ſo let it dry leiſurely; then lay the *Butterfly* on the paper, and when you have fixt it well, cut away the body cloſe to the wings, and throw it away; (that the preſſing of the body may not ſqueeze out the intrails, and ſpread and ſmear the impreſſion) then lay the paper on a ſmooth board, with the wings of the butterfly upwards, and on the fly another paper, and a ſmooth trencher upon that; and put the boards, paper, and wings all together into a linen ſcrew-preſs, and ſcrew it down very hard, and let it ſtand in it for an hour; and then take off the butterfly's wings, and there will remain on the paper their perfect impreſſion in all their beautiful colours.

But if you have not a ſcrew-preſs, lay weights upon your uppermoſt board, and it will come off very well.

The reaſon of this is, that all the fine colours that appear on the wings of a butterfly, are a ſort of fine ſeathers, or rather a powder, which ſticks ſo faſt to the gum, that when the gum is dry, they leave the wing.

After you have thus gotten the beautiful wings, you may draw the body, *&c.* of the butterfly, and colour the drawing of it after the life.

NICHOLAS BYER was a hiſtory and face painter, born at *Dronthem* in *Norway*. He was much employed by the late Sir *William Temple* at his houſe at *Shene*, near *Richmond*, in *Surrey*, where he died about forty ſix or forty ſeven years ago. He was a painter of good hopes, but died young, the effect of an intemperate life. He lived with Sir *William* three or four years, during all which time, he was conſtantly employed by him in one ſort of painting or other.

One thing is remarkable in him, and that is, that he was the firſt man that was buried in St. *Clement's Danes*, after it was rebuilt, and which had been firſt built by his countrymen.

C.

C. B. ſignifies *Cornelius Boſs.* This artiſt engraved *Julio Romano's Bacchanal.*

C. *Bl.* } ſignifies *Cornelius Bloemart*, ſon of the famous
Born. Blo. } *Dutchman*, *Abraham Bloemart.*

C. *Bleher*, the mark of *Cornelius Bleher* in certain hiſtorical landſcapes 1636.

CALAMINE STONE }
LAPIS CALAMINARIS }
CALAMITE }
CADMIA } a kind of foſſil bituminous earth much us'd in foundery; being us'd in tinging copper of a yellow colour, *i. e.* in converting it into braſs.

It is either of a greyiſh colour, as that of *Germany* and *England*; or reddiſh, as that about *Leige*, and in ſome parts of *France*, accounted the beſt, becauſe yellow by calcination.

It is dug out of mines, uſually in ſmall pieces, having eyes, ſometimes veins, of lead uſually; tho' not always found in lead mines.

It is generally dug in barren rocky ground; its courſes running uſually at ſix a clock (as the miners phraſe it) *i. e.* from eaſt to weſt, ſometimes at nine and ſometimes at twelve; or perpendicular, which is accounted the beſt.

After it has been dug, it is waſh'd, or *buddled* (as they term it) in a running water, which carries off the impurities and earthy parts, leaving the lead, *calamine*, and other ſparry parts at the bottom; then it is put into a ſieve, and ſhaken well in water, and the lead that is mixt with it ſinks to the bottom, the ſparry parts aſcend to the top, and the *calamine* remains in the middle.

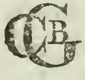
Having been thus prepar'd, they bake it in an oven for four or five hours, the flame being ſo contriv'd as to paſs over, and ſo to heat and bake the *calamine*; it is kept continually ſtirred and turned with an iron rake.

This being done, it is pounded to a powder, and all the ſtones found in it are picked out, and then it is fit for uſe.

As to the manner of applying it in the preparation of braſs, ſee the article BRASS. And for other uſes, other articles.

PAOLO CALIARI *Veroneſe*, born in the year 1532, ſcholar of his uncle *Antonio Badile*, liv'd at *Venice*, excell'd in hiſtory and portraits, died in the year 1588, aged fifty-ſix years.

CALLIOPE, one of the muſes, the preſident of heroick poetry, is repreſented in painting with a coronet of gold upon her head, and upon her left arm garlands of bays in ſtore for the reward of poets; and in her right hand three books, on which are written, *Homerus*, *Virgilius*, *Ovidius*.



GIO or *(John)* BAPTISTA CALLESTRUCCI an engraver, who is inſerted in the catalogue of *Roman* painters in the year 1652, uſed this mark.

CALKING } a term us'd in painting, &c. where the back-
CALQUING } ſide of any deſign is covered with a black or red cololour; and the ſtrokes or lines, trac'd thro' on a wax'd plate, wall, or other matter; by paſſing lightly over each ſtroke of the deſign with a point, which leaves an impreſſion of the colour on the plate or wall.

CALUMNY is repreſented in painting by a beautiful, rich, and young woman, approaching towards a judge in gorgeous habit, with an angry, ſcornful, and diſcontented look, and red and fiery eyes; holding in her left hand a flaming torch, and with her right hand, ſhe by force draws a young man by the hair of the head.

LUCA CANGIASI, *or* CAMBIASO, born in the year 1527, ſcholar to his father, liv'd at *Genoa* and in *Spain*, excell'd in hiſtory, died 1683, aged fifty ſix years.

CAMERA OBSCURA, *i. e.* a DARK CHAMBER, is a machine or apparatus, repreſenting an artificial eye; whereon the images of external objects are exhibited diſtinctly, and in their native colours, either invertedly or erect.

The uſe of this machine is manifold; it ſerves to many good purpoſes in explaining the nature of viſion; and hence it is that it is by ſome call'd the *artificial eye.*

It affords very diverting ſpectacles, both by exhibiting images, perfectly like their objects, and each cloth'd with their native colours; and by expreſſing at the ſame time all their motions, which latter no art can imitate.

The theory of the *Camera Obſcura* is contained in the following propoſition.

If an object A B *(figure 1.)* radiate through a ſmall aperture C, upon a white wall oppoſite thereto, and the place of radiation behind the aperture *b* C *a* be dark; the image of the object will be painted on the wall in an inverted ſituation.

Demonſtration. For the aperture C being very ſmall, the rays iſſuing from the point B will fall on *b*; thoſe from the points A and D will fall on *a* and *d*: wherefore ſince the rays iſſuing from the ſeveral points are not confounded, when reflected from the wall, they will carry with them a certain ſpecies of the object, and exhibit its appearance on the wall.

But ſince the rays A C and B C interſect each other in the aperture, and the rays from the loweſt parts fall on the higheſt, the ſituation of the object will of neceſſity be inverted.

Corollary. Since the angles at D and *d* are right, and the vertical ones at C are equal, B and *b* and A and *a* will be alſo equal; conſequently, if the wall whereon the object is delineated, be parallel to it, *a*, *b* : A B : : *d* C : D C; that is, the height of the image will be to the height of the object, as the diſtance of the object from the aperture, is to the diſtance of the image from the ſame. See the plate, figure 1.

Conſtruction of a CAMERA OBSCURA, wherein the images of external objects ſhall be repreſented diſtinctly, and in their genuine colours, either in an inverted, or an erect ſituation.

1. Darken a chamber, one of whoſe windows looks into a place ſet with various objects, leaving only one little aperture open in the window.

2. In this aperture fit a lens, either *plano convex*, or convex on both ſides, to be a portion of a large ſphere.

3. At a due diſtance, to be determin'd by experience, ſpread a paper or white cloth, unleſs there be a white wall for the purpoſe; for on this, the images of the deſired objects will be delineated invertedly.

4. If you would rather have them appear erect, this may be done either by means of a concave lens, plac'd between the centre and the focus of the firſt lens; or by receiving the image on a plane *ſpeculum*, inclin'd to the horizon under an angle of 45°; or by means of two lens's included in a draw tube inſtead of one.

Note, that if the aperture don't exceed the bigneſs of a pea, the objects will be repreſented, even tho' there be no lens at all.

To render the images clear and diſtinct, 'tis neceſſary that the objects be illumin'd by the ſun's light; they will be ſtill brighter, if the ſpectator firſt ſtay a quarter of an hour in the dark.

Care muſt be likewiſe taken, that no light eſcape through any chniks; and that the wall ben't too much illumin'd.

Farther, the greater diſtance there is between the aperture and the wall, the larger and more diſtinct will the images be; but the rays becoming thus too much dilated, the brightneſs of the image is weakened, till at length it becomes inviſible.

The conſtruction of a portable CAMERA OBSCURA.

1. Provide a little cheſt or box of dry wood, in the figure of a parallelopipedon, in breadth about ten inches, and its length two feet or more, according to the different magnitude of the diameter of the lens. See plate, fig. 2.

2. In the plane B D, fit a ſliding tube E F with two lens's, or to ſet the image at a leſs diſtance from the tube with three lens's convex on both ſides; the diameter of the two outer and forwarder to be $\frac{10}{100}$ of a foot; that of the inner leſs, v. g. [illegible].

3. Within the cheſt, at a proper diſtance from the tube, ſet up an oil'd paper, perpendicularly G H, ſo as that images thrown upon it may be ſeen through.

4. And laſtly, make a round hole in I, ſo as a perſon may look conveniently through it with both eyes.

If then the tube be turn'd towards the objects (the lens's being at their proper diſtance, which is to be determined by experiment) the objects will be delineated on the paper G H as before.

Another portable CAMERA OBSCURA.

1. In the middle of a *ciſtula* or cheſt, (ſee plate, figure 3.) raiſe a little turret, either round or ſquare H I, open towards the object A B.

2. Behind the aperture, incline a little plain mirror *a b* to an angle of 45, which may reflect the rays A *a* and B *b* upon a lens convex on both ſides G, included in a tube G L.

3. At the diſtance of the focus of it, place a table, covered with a white paper E F, to receive the image *a b*.

4. And laſtly, in N M make an oblong aperture to look thro'.

By means of this inſtrument, a perſon unacquainted with deſigning, will be able to delineate objects to the laſt accuracy and juſtneſs; and another well vers'd in painting, will find many things herein to perfect his art.

DO
CAP

DOMENICO CAMPAGNOLA, a *Venetian*, and ſcholar to *Titian*, us'd this mark; we meet with ſome of his pieces engrav'd in 1518. His brother *Julio* was alſo an engraver.

ANNIBAL CARACCI, born in the year 1560, ſcholar of *Lod. Caracci*, ſtudied *Correggio*, *Titian*, *Rafael*, and the antique, liv'd at *Bologna* and *Rome*, excell'd in hiſtory died 1609, aged forty nine years.

ANTONIO CARACCI, call'd IL GOBBO, born in 1583, ſcholar of *Annibal Caracci*, liv'd at *Rome*, excell'd in hiſtory, died in 1618, aged thirty five years.

LODOVICO CARACCI, born in the year 1557, ſcholar of *Proſpero Fontana*, and ſtudied *Parmegiano*, *Titian*, &c. liv'd at *Bologna* and *Rome*, excell'd in hiſtory, died in 1619, aged ſixty four years.

AUGUSTINO CARACCI, born in the year 1557, ſcholar of *Domenico Tebaldi*, *Aleſs. Minganti*, and his couſin *Lodovico*; liv'd at *Bologna*, *Rome*, and *Parma*, excell'd in hiſtory graving, died in the year 1602, aged forty five years.

POLYDORO *da* CARAVAGGIO, born in 1495, ſtudied *Gio. d'Udine* and *Matturino*; liv'd at *Rome*, *Naples* and *Meſſina*; excell'd in hiſtory and architecture; died in the year 1543, aged forty eight years.

CARBUNCLE is a very precious ſtone, of which ſeveral authors have written; but I don't know one who ſays he has ſeen it.

They attribute to this ſtone the property of giving light in the dark like a burning coal, or a kindled lamp.

Ludovicus Verromannus reports, that the King of *Pegu* carried one about him of ſuch bigneſs, and ſo great ſplendor, that thoſe who ſaw that prince when it was dark, ſaw him ſhining as if incircled with the ſun; but this author, as well as the reſt, ſays he never ſaw one.

Pliny pretends, there are many ſorts of Carbuncles, ſome male ones more hard and brighter, and others female more languid.

guid. But this author is ſo indiſtinct and ſo little aſſur'd of it, that his teſtimony cannot be taken for authentick. Yet among all thoſe ſpecies which he deſcribes, thoſe ſeem to approach the neareſt to *carbuncles*, which he calls *Lithizontes* and *ſandaſtri*.

The firſt diſcovers ſtrongly its ſplendor at the fire or ſun; being in the ſhade, it appears of a purpliſh colour; being expos'd in the open and clear day, it ſparkles as it were at the ſun-beams, and hides as it were bright ſtars within it.

The ſecond is curious, by reaſon of golden ſparkles appearing and glittering within like ſtars, which are always ſeen acroſs it within ſide, but never near the ſurface, imitating the *Hyades* by their number, diſpoſition, and order.

This author ſays laſtly, that the *Chaldæans* held this laſt ſtone in great veneration, and us'd it in all their ceremonies.

It is indeed very probable, that the *Carbuncle* is that ſtone the antients have related to give light by night, like a flaming fire, and by day like a twinkling ſtar, which is now no more to be found.

But whether the *Carbuncle* be a precious ſtone, found in the bowels of the earth or not, the properties that theſe authors have given it, may be imitated by the help of art. And this may be done two ways, as follows.

Take ten ounces of matter, prepar'd with *ſaturnus glorificatus*, (ſee SATURNUS, *&c.* in S.) and natural cryſtal reduced to an impalpable powder, as there directed; add to this half an ounce of *crocus Martis* in fine powder prepared. (See CROCUS, *&c.*)

Mix theſe powders well together, and put them into a good crucible, which cover and lute well; then put it into a glaſs houſe fire for three days, putting it nearer and nearer the ſtrength of the fire by degrees.

Then take out the crucible, and put the matter into a marble mortar; then pound and grind it very ſmall, with its weight of *ſal gemmæ*, and put it into another crucible, which cover and lute as before.

Being dry, put it into the ſame glaſs houſe furnace, removing it nearer to the fire by little and little, and let it ſtand for twenty four hours in a good fuſion.

Then take it out, and put it into the furnace to bake again, as you do glaſs, where leave it twelve hours, that it may cool gently.

When the crucible is cold, take it out of the furnace to bake again, then break it, and you'll find in it the matter tinged of a very fine *carbuncle* colour, which you may cut of what form you pleaſe; poliſh it at the wheel, and it will be perfect.

CARBUNCULUS *nocte illuminans*, which is a ſtone far more reſplendent and fairer than the former, But this is not a ſtone any where form'd by nature; but may be made by art.

But to imitate this ſecond Carbuncle, or rather the beauty which authors attribute to it, do as follows.

Take ten ounces of matter, prepar'd of natural *cryſtal*, and *ſaturnus glorificatus*, and having reduced them to an impalpable powder, add to it an ounce of gold calcin'd (as will be ſhewn in the articles CALCINE or GOLD) mix the whole well together, and put it into a good crucible, which muſt not be above half full; cover it and lute it well, let it dry; then put it into a glaſs houſe furnace for three days, bringing it by little and little nearer to the ſtrongeſt fire.

After three days, take out the crucible, and put the matter into a marble mortar, which pound to an impalpable powder, to which add its weight of *ſal gemmæ*, alſo in fine powder, which mix well together, and ſearce through a fine ſieve, the better to incorporate.

Put this powder into a new crucible, which you muſt not fill above half way; which cover, lute and dry as before: then put it into a glaſs houſe furnace, bringing it nearer to the fire by little and little, where let it ſtand ten hours.

After this, take your crucible out of the furnace, and put it into that where they ſet their glaſſes to anneal; let it ſtand for ten or twelve hours; then take it out, and by breaking it, you will find the matter ting'd of a *carbuncle* colour, the moſt lively and reſplendent that can be made by this art; whereof you may make what ſtones or works you pleaſe.

CARE. Though it commonly makes one old, yet ſhe in painting is repreſented ſo as to appear comely; ſhe is winged holding two hour glaſſes, a cock at her heels, and the ſun riſing from the ocean.

Her handſomeneſs denotes her taking time by the forelock, and ſtopping all good things; the wings denote quickneſs; the glaſſes and ſun ſhew that care and ſolitude is never weary.

CARICATURAES [in painting] as to make caricaturaes is to exaggerate, the defects, and conceal the beauties in perſons faces; however preſerving the reſemblance.

JOHN CARINGS was an *Engliſh* landſcape painter, who lived the better part of his time in *Holland*, and drew many views of that country in a manner very neat and elaborate. His pieces bore a great price in his life-time, but having little beſides their neatneſs to recommend them, they have ſince been leſs eſteemed. He died at *Amſterdam* about ninety ſix years ago.

ANNE CARLISLE was an *Engliſh* gentlewoman, contemporary with *Van Dyck*. She copied the *Italian* maſters ſo admirably well, that ſhe was much in favour with *Charles* I. who became her patron, and preſented her and Sir *Anthony Van Dyck* with as much ultramarine as coſt him above 500 *l.* She died in *London* about fifty two years ago.

CARLO (call'd CARLINO) DOLCI, born in the year 1616, ſtudied *Jacopo Vignali*, liv'd at *Florence*, excell'd in Hiſtory.

CARMINE, a red colour, very vivid, bordering ſomewhat on the purple, us'd by painters in miniature; and ſometimes painters in oil, tho' rarely, by reaſon of its great price.

Carmine is the moſt valuable product of the *cochineal meſtique*; which is a fecula or ſediment, reſiding at the bottom of the water, wherein *cochineal*, *conan*, and *antour* has been ſteep'd: ſome add *rocou*, but this gives carmine too much of the oval caſt.

That which is good is almoſt in an impalpable powder.

Some make *Carmine* with *brazile wood*, *fernambouc*, and leaf gold beat in a mortar, and ſteep'd in white wine vinegar; the ſcum ariſing from this mixture, upon boiling, when dryed, makes *Carmine*; but this kind is vaſtly inferior to the former.

Another Carmine. Steep a pound of *brazile* wood, of *fernambouc* of the colour of gold, for three or four days in an earthen veſſel or pot of white wine vinegar; after having broken it well in a mortar, boil it half an hour.

Then paſs or ſtrain it through a very courſe linen cloth, and ſet it again upon the fire.

Take another little pot of white wine vinegar, and in it ſteep or temper eight ounces of alum. Put this alum ſo tempered in the other liquor, and ſtir it about well with a ſpatula.

The ſcum or froth which ariſes is the *Carmine*; take it off as it riſes, and let it dry. The ſame may be done with *cochineal* inſtead of *brazile.*

Another Carmine. Take three pints of ſpring water, which has not paſſed through leaden pipes; put it into a glaz'd earthen pot, and ſet it on the fire.

When it is ready to boil, put in half or a quarter of an ounce of the grain of *cohan* or *dyer's red*, which the feather dyers uſe, reduc'd to a fine powder.

Then boil it for about three quarters of an hour, or till the fourth part of the water be conſum'd. Let the fire be a coal fire.

Then ſtrain this water through a linen cloth into another well glaz'd veſſel, and ſet it on the fire till it begins to boil; then put in an ounce of *cochineal*, and a quarter of an ounce of *arnotto*, both reduc'd to powder apart; and let this liquor boil away to one half, or rather till it raiſes a black ſcum, and is very red; for it takes a colour by being boil'd.

Then take it off the fire, and ſtrew into it half an ounce or three pinches of *roch alum*, or *Roman alum*, pulveriz'd, which laſt is reddiſh and better; and about half a quarter of an hour after, ſtrain it through a linen cloth into a veſſel well glaz'd, or you may divide it in ſeveral ſmall *Dutch* glaz'd porringers, in which let it ſtand to ſettle for twelve or fifteen days, and there will appear on the ſurface a mouldy skin, which you are to take off with a ſpunge, and expoſe the matter underneath to the air.

When the watry part on the top is evaporated, dry the matter which remains at the bottom, and grind it upon a very hard and ſmooth marble ſtone or porphyry, and then ſift it through a very fine ſieve.

The quantities of theſe ingredients are not ſo fixt to the proportion before directed, but that you may put in either more or leſs of them at diſcretion, according to the depth or degree of colour you deſire.

If you would have the *Carmine* redder, you may put in more *arnotto*, if more of a crimſon, more *cochineal*; but all of them muſt be reduc'd to powder ſeparately, and the grain of *cohan* or *dyers weed* muſt firſt be boil'd alone, and the other altogether as before directed.

CARNATIONS [in miniature.] It is the ſame with *carnations* and *pinks* as with *anemonies* and *tulips* (both which ſee) for ſome of them are variegated or mixed with ſeveral colours, and ſome of them are of one ſingle colour.

The firſt are ſometimes ſtreak'd, ſtriped, or mark'd, ſometimes with *vermilion* and *carmine*, and ſometimes with *lake*; at other times with pure *lake*, or with *white*. Some are deep, others are pale; ſometimes they are variegated with ſmall or narrow ſtrokes.

Their grounds are commonly ſhaded with *indigo* and *white*.

There are ſome of theſe flowers of a very pale fleſh colour, and variegated with another deeper, made of vermilion and lake.

Others are of *lake* and *white*, which are ſhaded and variegated without *white*.

Others again are all *red* with *vermilion* and *carmine*, as deep as poſſible.

Others again are all lake.

In ſhort, there are others of great variety, which nature her ſelf, or your own fancy, will direct you to repreſent.

The green of all of them is of the ſea hue, and ſhaded with *Iris green*.

CARNATION, *i. e. Fleſh colour* in painting, is underſtood of all the parts of a picture in general, which repreſent fleſh; or which are naked, without drapery.

Titian and *Corregio* in *Italy*, and *Rubens* and *Van Dyke* in *Flanders*, excell'd in *carnations*.

Of Carnations or Fleſh Colouring [in miniature]. In clouring for fleſh, there is ſo great a variety, that it is hard to lay down any general rules for inſtruction therein, neither are any rules regarded by thoſe who have acquir'd a skill this way; for they copy from originals, or work by their own heads, without knowing particularly, why or wherefore; ſo that the moſt able hands, who work with the leaſt thought and trouble, would be ſo much the harder put to it, if they were call'd upon to aſſign a reaſon for their practice and teaching as to their colouring and tints.

Neverthleſs, as beginners ſtand in need of immediate inſtruction, I ſhall here, in general, ſhew how you are to paint the different ſorts of fleſh.

Firſt then, having drawn your figure with carmine and adjuſted your piece, you muſt lay on for women, children, and in general, for all ſoft and tender colouring, white mixt with a little blue for faces, the compoſition of which will be given hereafter; but it muſt hardly appear.

And for men, inſtead of blue uſe vermilion for your dead colouring, and when they are old, let it be mixt with oaker.

Then you are to run over all the features with *vermilion*, *carmine* and *white* mingled together, and form all the ſhades with the ſame mixture, adding *white* as they weaken, uſing ſcarce any of it as they ſtrengthen, except in certain places, where it muſt be laid on boldly; as for example, at the corners of the eyes, under the noſe, the ears, under the chin, between the fingers, in all the joints, the corners of the nails, and generally in every part where it is neceſſary to expreſs a ſeparation in the dark ſhades; nor need you fear to give them all the ſtrength which they ought to have from the firſt sketch, becauſe in working thereon with green, it conſtantly weakens the red which was firſt laid on.

Having drawn with red, make blue tints with ultramarine and a good deal of white, upon the temples, beneath and at the Corners of the eyes, on each ſide of the mouth, above and below it, a little upon the middle of the forehead, between the noſe and the eyes, on the ſides of the cheeks, on the neck, and other parts where the fleſh has a bluiſh caſt.

Alſo you muſt make yellowiſh tints with oaker, orpiment and a little vermilion mixt with white, above the eye-brows, at the ſides of the noſe towards the bottom, a little beneath the cheeks, and the other parts near.

In theſe it is that you muſt well obſerve nature, for painting being no more than an imitation of nature, every deviation from her is a blemiſh, and truly a fault.

Now having dead colour'd, drawn, and diſpoſed of your tints, you muſt proceed to ſhade, ſtippling with green for your fleſh, mixing therewith, according to the rule preſcrib'd for tints, a little blue for the fading parts; and on the contrary a little yellow for the ſtronger parts, or ſuch as are neareſt to you. On the extremities of the ſhades, next to the lights, you muſt imperceptibly blend your colour with the ground of the fleſh, firſt with blue, then with red, agreeable to the part you are upon; and if this mixture of green does not darken enough at firſt, you muſt go over the ſhades with ſeveral repetitions, ſometimes with red, and ſometimes with green, always ſtippling till the whole be perfect.

And if with the colours you cannot give your ſhades all the ſtrength they ought to have, you may finiſh the darkeſt parts with orpiment, oaker or vermilion, and ſometimes with biſtre only, according to the colouring you would make, but lightly, laying it on very thin.

You muſt ſtipple upon the lights with a little vermilion or carmine, mixt with a good deal of white, and a very little oaker, to loſe them with into the ſhades, and make the tints die away imperceptibly into each other, taking care while you are ſtippling or hatching, that your ſtrokes follow the out-line of the fleſh; for although your hatching muſt croſs in all directions, that ought to appear a little more, becauſe it rounds off the parts.

And becauſe this mixture might make the colouring too red if it was always uſed, moreover you muſt endeavour to confound the tints and the ſhades with blue, a little green, and a great deal of white, ſo that it be very pale; but with this you muſt not work upon the cheeks, nor upon the extremities of the lights, no more than with the other mixture upon theſe laſt, which are to be left in all their brightneſs, as certain parts of the chin, of the noſe, upon the forehead, and upon the cheeks, which, and the chin, ought, however, to be redder than the reſt, as well as the feet, the inſide of the hands, the fingers, and the toes.

Obſerve here, that theſe two laſt mixtures ought to be ſo very pale, that you ſhould hardly ſee your ſelf work, they being purely deſign'd to ſoften the piece, to melt the tints into each other, to blend the ſhades with the lights, and to deface the lines; be careful not to make much uſe of the red mixture upon blue tints, nor of blue upon others; but change colour from time to time, as you perceive your work too blue or too red, 'till the piece be finiſh'd.

The various colourings for *Carnations* may be eaſily produc'd by taking more or leſs *red*, *blue*, *yellow* or *biſtre*; whether for the firſt colouring or for finiſhing the colouring for *women* ſhould be *bluiſh*; for children a little red; both freſh and gay, and for the men it ſhould incline to yellow, eſpecially if they are old.

Of dying a Carnation or Red-Roſe colour.

I. *To dye a Red-Roſe Carnation or blood red.* Take liquor of wheat bran, a ſufficient quantity, alum three pounds, tartar two ounces, boil them and enter twenty yards of broad cloth, boil three hours, cool and waſh it; take freſh clear bran liquor a ſufficient quantity, *madder* four pounds, boil and ſadden according to art.

II. *Red-Roſe or Carnation colour.* Take wheat bran liquor a ſufficient quantity, alum two pounds, *tartar* two ounces, boil and enter twenty yards of camlet, boil three hours; after which, take it out and waſh it very well, then add *madder* a pound, enter and boil it again, cool and waſh it; after which take clear liquor a ſufficient quantity, *cochineal* in fine powder two ounces, tartar two ounces; enter your camblet, boil and finiſh.

III. *Another Carnation colour.* Take running water four gallons, pot aſhes two pounds, mix and digeſt forty eight hours, this done, divide the liquor half into one pot, and half into another pot; let the firſt pot ſtand in the hot embers up to the top or in a furnace, and the other by a fire to keep warm, and to fill up the firſt pot as it boils away; into the firſt put *red briſca* or *Spaniſh flocks*, or wool two pounds, let it boil till it is thick, adding alum and a little gum Arabick, of each the quantity of a walnut; diminiſh the heat and let it be only ſcalding hot, then put it in the matter you would dye, letting it lye twenty four hours in the liquor.

IV. *An excellent Obſervation.* The *Bow-dyers* know that the ſolution of *Jupiter* (which is delved tin) being put in a kettle to the *alum* and *tartar*, makes the cloth, *&c.* attract the colour into it; ſo that none of the *cochineal* is left, but is all drawn out of the water into the cloth.

V. *Another Obſervation.* The ſpirit of *nitre* being uſed with *alum* and *tartar* in the firſt boiling, makes a firm ground, ſo that they ſhall not ſpoil nor loſe their colour by the ſun, fire, air, vinegar, wine, urine or ſalt-water, *&c.*

GLORALAMO DA CARPI, born in the year 1501. ſcholar of *Renvenuto Gorofalo*, ſtudied under *Correggio*, liv'd at *Bologna*, *Modena*, *Ferrara*, *Rome*, &c. excell'd in hiſtory and architecture, died in the year 1556, aged fifty five years.

UGO DA CARPI, he found out the art of printing in *chiaro obſcuro*, with two plates of box, then with three like drawings.

CARTON, } is a deſign drawn on ſtrong paper, to be afterwards calk'd through, and transfer'd on
CARTOON, } the freſh plaiſter of a wall to be painted in freſco.

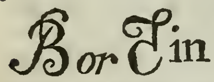
CARTOON, is alſo us'd for a deſign coloured, for working in *moſaic*, *tapeſtry*, &c.

The cartoons preſerv'd at *Hampton-Court*, are deſigns of *Raphael Urbin*; intended for tapeſtry.

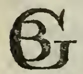
JACOBO CARUCI *da* PUNTORM, born in the year 1493, ſcholar of *Lionardo da Vinci*, *Marietto Albertinelli*, *P. di Coſimo*, and *Andrea del Sarta*; liv'd at *Florence*, excell'd in hiſtory and portraits, died in the year 1556, aged ſixty three.

CARYATIDES } a kind of order of columns or pilaſters in architecture, under the figures of women
CARIATES } dreſs'd in long robes.

GIORGIO *del* CASTEL FRANCO, call'd GLOROIONE, born in the year 1477, ſcholar of *Gio. Bellini*, and ſtudied *Lionardo da Vinci*; liv'd at *Venice*, excell'd in hiſtory, painting and portraits, died in the year 1511, aged thirty four years.



The firſt of theſe marks is of *Bernardo Caſtelli*, a *Genoeſe* painter and inventor. The ſecond is of *Cammillo Congio*, an engraver, whoſe mark was alſo C C *Fecit*.



GIO BENEDETTO CASTIGLIONE of *Genoa*, a famous painter and engraver of all ſubjects, uſed this mark.

BENEDETTO CASTIGLIONE, a *Genoeſe*, the ſcholar of *Batt. Paggi*, inſtructed by *Van Dyke*, rambled in *Italy*, excell'd in hiſtory, landſcapes and animals.

Of CASTING FIGURES *in* PLAITER. Beſides what is ſaid of making a cavity for caſting in wax, ſee WAX, (ſee the articles FOUNDERY and STATUES) it will be no hard matter to conceive how figures are made of PLAISTER; for it being eaſily tempered, and running as eaſily, 'tis poured into the mould, and ſometimes the figures are taken out all in one piece, eſpecially when the founder is maſter of his buſineſs, and well experienced in it.

All the art is to chuſe good *plaiſter* in ſtone, that there may be no coal among it; it ought to be well burnt, well pounded, very white, ſifted through a fine ſieve: however, if it is a great figure, 'tis moulded at ſeveral times, and even ſeveral parts of the figure, in each piece of the cavity, are half fill'd before they are ſet together, that they may hold the better, and the better form all the parts.

We ſee by what *Pliny* writes, that the cuſtom of making moulds of *plaiſter* is very antient; and that 'twas made uſe of about earthen figures and plaiſter figures a long time before it was known how to caſt in metal.

CASTING *Figures in* LEAD. There are not ſo many precautions neceſſary when figures are caſt in LEAD, as when they are done in braſs; becauſe *lead* is not ſo ſtrong. See STATUES.

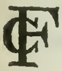
The workman only fills the cavities with earth well managed, of what thickneſs he pleaſes; then he fills all the mould with *plaiſter* or *tile-duſt*, with which the ſoul is made.

When the ſoul is finiſh'd, all the pieces of the mould are taken aſunder, to take off the earth; and then being clos'd again, are put about the ſoul, but at four or five inches diſtance.

That interval is fill'd with coal from top to bottom; all the gaps between the pieces of the mould are fill'd with *brick*, and the coal being ſet fire to, 'tis all lighted. This is to ſeeth the ſoul, and dry the plaiſter mould which the earth had wetted.

When all the coal has been well lighted, and after it is gone out of it ſelf, the workman takes a pair of bellows, and blows off the aſhes that may have got into the pieces of the mould; then thoſe pieces are join'd together again as before about the mould; all the *chapes* are well ty'd with cords, and cover'd with *plaiſter*; after which the melted lead is pour'd into the mould, which lead fills the ſpace which was taken up by the earth; nor is it neceſſary to earth the mould as in caſting in braſs, unleſs 'tis for great figures.

The tools us'd in caſting in lead are the ſame the plummers uſe.



FRANCIS CAVEAU, who engrav'd a great many plates, us'd this mark.

FREDERICO CASAUBON, *alias* KERSEBOOM, was born at *Solingen* a city of *Germany* in the year 1623. At eighteen years of age, he went to *Amſterdam* to be inſtructed in the art of painting; to *Paris* in 1650, and work'd ſome years under Monſieur *le Brun*; but afterwards was ſent to *Italy* by the Chancellor of *France*, and maintained there by that miniſter for fourteen years, two whereof he ſpent with *Nicholas Pouſſin*, of whoſe manner he was ſo nice an imitator, that ſome of his pieces were taken for his. Thus qualified for hiſtory painting, he came to *England*; but not finding encouragement that way, he bent his ſtudies towards portraits, wherein he was not unſucceſſful, either as to drawing or likeneſs. He was the firſt who brought over the manner of painting on glaſs, (not with a print, as the common way now is) in which he perform'd ſome hiſtories and heads exceedingly well. Perſpective he underſtood thoroughly, having been diſciple to two excellent maſters in that art; and was, in ſhort, an accompliſhed painter. He died in *London* in the year 1690, and lies buried in St. *Andrews Holbourn.*

C. C. *Fecit.* ſtands ſometimes for *Camillus Congius*, and ſometimes for *Charles Cignali* of *Bologna*, painter, *inv.* He uſed alſo two C's, the one within the other.

C. D. F. ſignifies *Charles David fecit.*

CELERITY is repreſented in painting, by a woman with a thunderbolt in her right hand, a dolphin by her ſide, and a hawk flying in the air.

The moral is obvious, all thoſe things being naturally very quick in their motion, which well expreſſeth celerity.

CEMENTS *as to melt cryſtal for a ſtrong Cement.* Pound cryſtal, and put it into an iron ladle, cover it and lute it well, and heat it in the fire till it is red hot, which quench in oil of tartar; this do ſo often, till they will be eaſily reduc'd to powder in a mortar, which will then eaſily melt.

This is of uſe to make ſtrong cement, and to counterfeit jewels with.

To make a CEMENT *for broken glaſſes.*

1. Mix glair of eggs with quick lime, and this cement will join broken pieces of glaſs together, and all earthen pots, ſo that they will never break in the ſame place again.

2. Or thus, Take old liquid varniſh and join the pieces with it; tie them together, and dry them well in the ſun, or in an oven, and they will never unglue again; but you muſt not put hot liquor into them.

3. Take white lead, red lead, quick lime, and gum ſandarack, of each half an ounce, and mix all theſe with the glair of four eggs.

4. Take quick lime powdered, liquid varniſh, and glair of eggs, of each a like quantity; grind them upon a ſtone; this will be a ſtrong cement even for ſtones. Or,

5. Take white lead, bole, and liquid varniſh as much as ſufficeth. Or,

6. Take fine powder of glaſs, quick lime and liquid varniſh, of each a ſufficient quantity.

7. Take calcin'd flints and egg-ſhells of each a like quantity, and with whites of eggs and gum tragacanth or diſſolution of gum ſandarach, make a cement. This in a few days will be as hard as a ſtone.

8. Take of calcin'd flints two pound, quick lime four pound, as much linſeed oil as may temper the mixture; this is a very ſtrong cement, but with liquid varniſh would be ſtronger.

9. Take fiſh glue, and beat it thin; then ſoak it in water till it is like a paſte; make rolls of it, which draw out thin, and

when you uſe it, diſſolve it in fair water over the fire, letting it ſeeth a while, keeping ſcumming of it, and uſe it while it is hot.

CERUSS a preparation of lead, commonly call'd white lead, and by the chymiſts calx of lead.

Ceruſs is made of very thin *laminæ* or plates of lead, ſo laid as to receive and imbibe the fumes of vinegar, plac'd in a veſſel over a moderate fire.

The *laminæ*, or plates, are by means hereof converted into a white ruſt, which is gathered together; and being ground up with water, is formed into little cakes.

Ceruſs makes a beautiful white colour, and is much us'd by painters both in oil and water colours.

The beſt *ceruſs* is that of *Venice*, but this is rare; that which is chiefly us'd, is either *Engliſh* or *Dutch*; both of which have more marl in them than white lead; the latter however is the better of the two.

CHALCEDONY, } is a precious ſtone of a bluiſh or yel-
CALCEDONY, } lowiſh colour, rank'd among the kinds of *agate*. It is ſuppos'd, by ſome, to be the *white agate* of the ancients, though there are ſometimes found pieces of it blackiſh.

This ſtone is very fit for engraving, and much us'd, either to engrave arms, &c. upon, as being harder and preferable to cryſtal, if good, or to paint them on the backſide. In ſome places, vaſes, cups, &c. are made of it. That which is cleareſt with a pale caſt of blue is accounted the beſt.

To make a CHALCEDONY *in glaſs*. There are three different ways to prepare an artificial *Chalcedony*, which will make three different ſpecies of it, all of them very fair, but whoſe beauty alſo may be augmented by the number of ingredients, they are compos'd of; and which cauſe thoſe diverſities of colours, which that ſtone ought to have.

Among the reſt of the ingredients employ'd for this purpoſe, there are ſome that give no colour to glaſs, as *tartar*, *ſoot*, *armoniac* and *mercury*.

Thoſe that are of an uncommon nature, as *lead*, *ſoot*, *tartar*, the *azure ſtone*, often hinder the union of the ingredients, by reaſon of the ſeparation which may happen by the cooling the metal; which does not happen to thoſe who know how to obſerve the degree of heat, wherein the principal knowledge of this art conſiſts.

To make the firſt ſort of CHALCEDONY. Put a pound of *aqua fortis* prepar'd into a glaſs body with a long ſtick, and two ounces of ſilver in ſmall and thin plates, or granulated, put the body in an aſh furnace over a ſoft fire or in warm water, and the ſilver will be preſently diſſolv'd.

At the ſame time, take another body and diſſolve in it three ounces of quickſilver, in twelve ounces of the ſame *aqua fortis*; then mix both the ſolutions together into a larger body, which ſet into the ſame bath of warm water, or aſh furnace; then add to it three ounces of *ſal armoniac*, which diſſolve over a gentle fire, then add to it half an ounce of *zaffer*, and a quarter of an ounce of *mangane[ſ]e* prepar'd by little and little, with as much *Feretto* of *Spain*, alſo by little and little; for fear the matter coming to ſwell too much, ſhould break the veſſel.

Add to all theſe ingredients half an ounce of *crocus martis* calcin'd with *ſulphur*, as much ſcales of *copper* three times calcin'd, which ought to boil like *manganeſe*; as much blue lake (ſuch as is us'd by painters) and the ſame quantity of red lead, the whole reduc'd to powder.

In putting in theſe powders, you muſt gently ſtir the glaſs body, that they may the better incorporate with the *aqua fortis*, but be ſure to take care that there be not too much heat; then ſtop the mattraſs (or glaſs body) very well, ſtirring it well every day for ten days, that the powders may well incorporate, and that they may always appear as ſeparated from the water.

Set the large glaſs body into a ſand furnace, in a temperate heat, or rather empty it into a glaſs cucurbit, after you have well luted it at the bottom, and ſet it over the ſame fire, ſo that the *aqua fortis* may evaporate in twenty four hours; and at the bottom of the veſſel you will have a yellow powder, which keep ſafely in glaſſes for uſe.

When you are to make the *Chalcedony*, take white cryſtal in glaſs, well purified, and that has been often melted; for cryſtal new made, is not fit for that operation, becauſe the colours will not ſtick to it, but are conſum'd by the frit.

Put about ten pounds of this cryſtalline glaſs into a pot, and when it is well melted, put in about an ounce and a half of your yellow powder at three different times, mix the glaſs well with it each time, that the powder may incorporate with it, the glaſs being thus well mixt; let it ſtand an hour, then mix it once more, and let it ſtand for twenty four hours; then mix it again for the laſt time, and make an eſſay of it, it will give a yellowiſh azure colour.

Having made your eſſay, and found your matter right, the pot may be taken out of the furnace, and when it is cold, you'll have the colours which ſhall repreſent the wavings of the ſea, and other fine things.

But to have a very fair *Chalcedony*, you muſt perform a ſecond operation, to join to the firſt, by taking four ounces of *tartar* calcin'd, one ounce of chimney ſoot well purified, one quarter of an ounce of *crocus martis* calcin'd with *ſulphur*, mix the whole together, then put it into the melted metal at five or ſix different times; otherwiſe the impetuous ſwelling of the metals would break the pot, and the whole would be loſt; which may be avoided by putting it in by little and little, ſtirring it each time well, that the matters may incorporate; alſo make the pot boil, and let it ſtand twenty four hours. After which time you may work it into what you pleaſe.

Which ſet into the furnace to whiten, and ſee if the glaſs pleaſe you, if it be green without, and blue, white, red, yellow, and of all other colours, like jaſper and oriental agate.

If looking on it obliquely, it be red like fire, and held to the ſun, it ſhews the colours of the rain-bow by reflection of the rays; if ſo, then it is fit to make all ſorts of veſſels, which may be poliſh'd at the wheel.

If it be pale and clear, more calcin'd tartar and ſoot muſt be added to it, as before, ſtirring it well to make it incorporate; then let the glaſs ſtand and purify ſeveral hours, and then you may work it, as you pleaſe.

Chalcedony is much us'd for the effigies of Kings and Princes, for heads, cups, and many other veſſels; principally for ſeals, becauſe it is eaſily engraven, and the wax will not ſtick to it.

A ſecond ſpecies of CHALCEDONY *finer than the former.*

1. Put a pound of *aqua fortis*, and three ounces of coppel'd *ſilver*, granulated into a glaſs body, in order that it may be the better diſſolv'd.

2. Put alſo a pound of *aqua fortis*, and five ounces of *mercury* well purified; and paſs'd through a glove into another glaſs body, and cloſe it well.

3. Put alſo a pound of *aqua fortis* with two ounces of *ſal armoniac*, into another glaſs veſſel to be diſſolv'd.

When it is diſſolv'd, add to it *crocus martis*, prepar'd *feretto* of *Spain*, leaves of copper calcin'd, by means of ſulphur, of each half an ounce; reduce the whole into powder, putting them in one after the other, and by little and little, for fear the matter ſhould break the veſſel.

4. Put one pound of *aqua fortis*, with two ounces of *ſal armoniack* into another earthen body, and when the whole is diſſolv'd, add ſucceſſively as before of good crude antimony, of blue enamel, ſuch as is us'd by painters, of red lead, and of vitriol well purified, each half an ounce, all of them well pulveriz'd; theſe alſo muſt be put in by little and little as before, for fear of breaking the veſſel, then cloſe it well.

5. Put alſo one pound of *aqua fortis*, and two ounces of *ſal armoniack* into another glaſs body, and when diſſolv'd, add two ounces of *zaffer* prepar'd, a quarter of an ounce of *mangane ſe* of *Piedmont*, alſo prepar'd, half an ounce of thrice calcin'd *copper* and an ounce

of *cinnabar*; reduce all to a fine powder, and put them in by little and little into the veſſel, taking care that the powders don't by too much ſwelling break the veſſel, then cloſe it well.

6. Put a pound of *aqua fortis*, and two ounces of *ſal armoniac*, into a ſixth veſſel of the ſame bigneſs as the reſt, and as ſoon as it is diſſolv'd, caſt in two ounces of *ceruſs* by little and little, for that will alſo cauſe a fermentation. Then add the like weight of painter's red lake, and as much of iron ſcales from the anvil, putting it in by little and little, for the reaſons before mentioned; and in a word proceed very ſlowly in all theſe operations, ſtopping all the veſſels well.

Set all theſe veſſels on a gentle fire of aſhes, or in a warm bath, to haſten the ſolution of the materials, they muſt be ſtirr'd at leaſt ſix times a day, for twelve days, in which they muſt continue in that heat, that the *aqua fortis* may the better penetrate the powders, and they communicate their tinctures the better to the glaſs. The twelve days being ended, put the whole into a large glaſs crucible, and lute it well for fear of breaking, pouring them gently in out of the ſix matraſſes one after the other, having firſt well ſtirr'd each of them; then ſet this cucurbit on a gentle aſh fire, and having fitted a head and receiver to it, and luted the joints well, then gently diſtil all the *aqua fortis* that is in the body, for the ſpace of twenty four hours, making a very gentle fire towards the end, otherwiſe the powders may be ſpoil'd by too much heat, and the ſpirits which ought to remain in the powder, would paſs into the receiver.

Then they will remain at the bottom of the veſſel of a yellowiſh red colour, which keep in a glaſs well ſtopp'd for tinging glaſs or cryſtal, which is yet better.

The third and laſt way of making a CHALCEDONY. This though ſomething more tedious ſurpaſſes the two other in beauty.

1. To make this preparation: Take the *aqua fortis*, of which put one pound into a glaſs matraſs, with four ounces of leaf ſilver to diſſolve, then ſtop the matraſs.

2. Put a pound of the ſame *aqua fortis*, with five ounces of *mercury* purified with ſalt and vinegar, after the following manner.

Put common ſalt into a wooden diſh, ſprinkle it with vinegar, and add to it a little common fair water to make it diſſolve, put in the mercury, and ſtir it well with a wooden peſtle to draw out the blackneſs, repeat the waſhing them often with ſalt and vinegar, till there be no more blackneſs; then dry them with warm linen or cotton, and paſs it through a glove; then it will be purified and fit to put into the *aqua fortis*. When it is diſſolv'd, ſtop the matraſs and keep it.

3. Take another glaſs body, put into it another pound of *aqua fortis*, with three ounces of fine ſilver calcin'd.

Amalgamate the *ſilver* with the *mercury*, as the gold ſmiths uſually do (See AMALGAMATION) and put it into a crucible, with its weight of common ſalt purified.

Then ſet the crucible on hot coals, that the mercury may evaporate, and that only the ſilver may remain at the bottom, which will be purified and calcin'd.

Then add to that calcin'd ſilver, an equal weight of common ſalt purified as before, mix them well together, and ſet them over the fire in a crucible to calcine them again; then waſh them well with warm water to take out the ſalt, and afterwards put this ſilver into a glaſs vial filled with common water, boil it, till one fourth of it is conſum'd, then let it cool and ſettle to the bottom, after that decant off the water, and put more upon it.

Repeat this proceſs with freſh water three times, and at the fourth dry the ſilver, and put it into the *aqua fortis*, and ſtir it well and ſtop the matraſs.

The method of purifying common SALT, *is as follows*: Diſſolve *ſea-ſalt* in a convenient quantity of common water, boiling it for the ſpace of two hours; then let the water reſt, that the earthy part of the *ſalt* may ſettle to the bottom; then filter the water and evaporate it in an earthen veſſel, or rather in a glaſs cucurbit, till the *ſalt* remain dry at the bottom.

Diſſolve this *ſalt* again, making the water boil, then let it ſtand for the dregs to ſettle, after which filter it and evaporate it as before; which you muſt continue to do, till there are no more *fæces* or dregs, and it will be well purified and prepar'd.

In order to continue the preparation of the materials.

4. Put a pound of *aqua fortis* into a glaſs matraſs, and add three ounces of purified *ſal armoniac*; that is to ſay filtred and whitened, till it leave no *fæces* or dregs, as has been ſhewn in common *ſalt*; then diſſolve a quarter of an ounce of ſilver in that water, and ſtop the veſſel well.

5. Put alſo another pound of *aqua fortis* into another glaſs matraſs, with three ounces of purified *ſal armoniac*, that is to ſay, filter'd and whitened till it leave no *fæces* or dregs, as has been ſhewn as to common *ſalt*; then diſſolve a quarter of an ounce of ſilver in that water, and ſtop the veſſel well.

6. Put alſo another pound of *aqua fortis* into another glaſs matraſs, with two ounces of *ſal armoniac* when it is diſſolv'd, put into that water *cinnabar* and *crocus martis* calcin'd with ſulphur as above; of *ultramarine* and *feretto* of *Spain* prepar'd, of each half an ounce, having reduc'd all to a fine powder; this muſt be put in by little and little, for fear of breaking the veſſel by the fermentation; which they make with the *aqua fortis*, then ſtop the matraſs.

7. Put a pound of *aqua fortis* into another matraſs, and diſſolve in it two ounces of *ſal armoniac* as before; add to it of *crocus martis* calcin'd with calcin'd tin, known among the glaſs men, of *zaffer* deſcribed and *cinnabar* each half an ounce, powdering them all very well, putting them in by little and little, as before, then ſtop the matraſs.

8. Put alſo another pound of *aqua fortis* into another matraſs, and diſſolve in it two ounces of *ſal armoniac*; then add an ounce of ſmall leaves of copper calcin'd, half an ounce of ſcales of copper thrice calcin'd, half an ounce of *manganeſe* of *Piedmont* prepar'd, and half an ounce of ſcales of iron, which fall from the ſmith's anvil, the whole being reduced to a fine powder; which throw in by little and little as before, then ſtop it well.

9. Put another pound of *aqua fortis* into another glaſs body, and add to it two ounces of *ſal armoniac*, the diſſolution being made, put to it half an ounce of red lead by little and little, and one ounce of ſcales of copper, half an ounce of *crude antimony*, and as much *caput mortuum* of vitriol purified, all being reduc'd to a fine powder; then ſtop the matraſs.

10. Put another pound of *aqua fortis* into another glaſs matraſs, with two ounces of *ſal armoniac*, add to this water orpiment, white arſenic and painters lake of each half an ounce; let the whole be finely powder'd, put them into a matraſs by little and little as before, and ſtop it up well.

It has not been repeated at each operation, that you muſt ſet your matraſs on an aſh furnace over a gentle heat, or in a warm bath to haſten the ſolution of the materials; becauſe it has been ſaid, that it muſt be always done in the preparation of theſe things, which are for tinging the firſt ſpecies of *Chalcedony*.

All the nine matraſſes mentioned in this proceſs, muſt remain fifteen days in the ſame heat, and be often ſtirr'd daily, that the water may the better operate on the materials, ſubtilizing them, and well opening their tinctures.

Then put all theſe materials with the *aqua fortis* into a large glaſs body, by little and little, that they may unite well together; cloſe the body, and ſet it on the ſame heat, ſtirring it well for ſix days.

After this, take a large glaſs cucurbit well luted half way up the body of it, and ſet it on an aſh furnace, put into it all the materials out of the body; fit a head and receiver to it, lute the joints well, and diſtil it for twenty four hours over a gentle fire, leſt the colours ſhould be ſpoil'd, that the water may paſs gently over, and the ſpirits remain in the powder, which of green will become yellow.

Thus putting that powder in the requiſite doſe (as has been taught in the firſt ſpecies of *Chalcedony)* into purified metal, made of broken pieces of cryſtal, and not of *frit*; and adding to it in its due time calcin'd *tartar*, chimney ſoot, *crocus martis* made with vinegar, as has been directed, and theſe materials will give an opacity to glaſs, which in twenty four hours time may be wrought, managing it well with proper tools and often beating it, and you will have things of an extraordinary beauty, greater than can be imagin'd.

CHARGE, } [in painting] is an exaggerated repre-
OVER-CHARGE, } ſentation of any perſon, wherein the likeneſs is preſerv'd, but withal ridicul'd.

Few painters have the genius to ſucceed in theſe *Charges*, the method is to pick out and heighten ſomething already amiſs in the face, whether by way of defect or redundancy; thus v. g. if nature has given a man a noſe, a little larger than ordinary, the painter falls in with her, and makes the noſe extravagantly long, or if the noſe be naturally too ſhort, in the painting he makes it a mere ſtump, and the like of the other parts.

CHARITY, is repreſented in painting, *&c.* by a woman all in red, a flame on the crown of her head with an infant ſucking, on her left arm and two other ſtanding up, one of which is embraced with the right.

The red colour denotes *Charity*, the flame ſignifies that *Charity* is never idle, but always active; the three children ſhew the triple power of *Charity*, for *Faith* and *Hope* without her ſignifies nothing.

CHASTISEMENT, is repreſented in painting, *&c.* by a ſevere furious fellow with an ax in one hand, as much as to ſay he will give but one blow, and a lion by him worrying a bear.

The ax is a token of *Chaſtiſement*, the moſt ſevere as is the lion in that poſture. The King of *Tenedos* made a law, that whoever committed adultery ſhould be beheaded, and did not ſpare his own ſon.

CHARON *Pluto*'s ferriman, who carries ſouls over the three rivers of hell, *Acheron*, *Cocytus* and *Styx*, is deſcrib'd old, yet exceeding robuſt and ſtrong, clothed with a black mantle, hanging looſely over his ſhoulders; and alſo ſometimes with long curl'd black hair, and clad in a robe of cloth of gold. *By Charon* is *ſignified* Time, and whereas he is ſuppos'd to have the tranſportation of ſouls, *from one ſide of thoſe rivers to the other, is intimated that ſo ſoon as we are born, and brought forth into the world, it doth carry it along by little and little unto our deaths; and ſo ſetteth us over thoſe rivers, whoſe names by interpretation ſignify ſorrowfulneſs, for that we paſs this life in miſery and adverſity.*

CHASTITY, is repreſented in painting, *&c.* by a modeſt, honeſt faced woman, holding a whip in one hand, as if ſhe would correct herſelf, clothed with a white robe; on her gridle is written *caſtigo corpus meum*, I chaſtiſe my body. At her feet *Cupid* lies conquer'd with his bow broken and he blinded.

The whip denotes chaſtiſement, the *Cupid* with his bow broken that no concupiſcence has dominion over her.

The way to make CHINA, *or fine Earthen-ware; how to Enamel, Paint, and Gild them.*

Porcelaine, China, or fine Earthen-ware, is enamell'd with our white ſtuff, which is already preſcrib'd for metals; and its painting the ſame, and of ſuch colours as we have propoſed for enamels.

The cuſtom of enamelling on earthen-ware is of greater antiquity than that on metals; for in the time of *Perſenna*, who generouſly undertook the reſtoration of *Tarquin* to the *Roman* government in the Conſulate of *Valer. Publicola* and *Horat. Pulvilius*, *ann. mund.* 3444, five hundred and four years before the coming of Chriſt, or thereabouts, the practice of enameling on ware was uſed in the eſtates of that prince; and what gives us very good reaſon to believe this is the name *Porcelane*, which has an affinity to *Porſenna*, though alter'd by the corruption of time. So it is alſo call'd *Fayence* from *Fayence* in the duchy of *Urbin*, where in the time of *Michael Angelo* and *Raphael Urbin*, this art was practiſed.

And as the ſecrets of nature are daily more and more diſcover'd, ſo has time employ'd the invention of man to improve this, and make it more excellent, not only condeſcending to enamelling, but proceeding alſo to painting and pourtraying thereon ſeveral curioſities, to which at length are added the ornaments of gilding.

Theſe pieces of ware are of a very general uſe over all the world, as for ornaments over chimney-pieces, on cabinets and tables, or boards. The choiceſt come to us from *China*, and next to them thoſe done at St. *Cloud* and *Rouen*; but there are very good made in *Holland*, at *Savonne* in *Italy*, and ſeveral other places in *France*.

The painting and enamelling on theſe, is what we are properly obliged to take notice of in our art; however, we ſhall ſlightly touch upon the compoſition and moulding the ware, and for this we will preſcribe fine and delicate methods ſufficient enough to anſwer the ſatisfaction of ſuch as employ themſelves in this art, and of thoſe perſons whoſe curioſity leads them to enquire after things, whereof they are not already inform'd.

The furnace for making of CHINA muſt be large, with an opening proportion'd to the veſſel you are to place therein; of theſe there are ſeveral ſorts, but the moſt commodious muſt be made as follows.

You may ſhape this furnace round or ſquare, but the ſquare is beſt, becauſe of the opening; it muſt be made of good brick, and ſuch ſtuff as can moſtly endure the fire, of what bigneſs you pleaſe, with three diviſions; the loweſt for aſhes muſt be a foot high, that the air may be communicated through its opening to the fire; the middle ſtory is for the fire, and muſt be underlaid with a very good grate, to ſeparate it from the under ſtory, with an opening for the fuel, and be vaulted above, about a foot in height. According to the ſize of your furnace, this vault muſt be made, like that of an oven, and have an hole in the middle, of the ſame ſhape as the furnace, round or ſquare, and proportion'd to its bigneſs, through which the flame may tranſmit itſelf to the uppermoſt ſtory, where the veſſels are put to bake in; this laſt ſtory is to be at leaſt two foot high, and its opening fourteen or fifteen inches, to put and draw the veſſels eaſily in and out; the top muſt be vaulted too with a round or ſquare hole, and over that a funnel, for the conveniency of the flame and ſmoak which it draws out.

All the opening, eſpecially to the two uppermoſt, muſt be of ſtrong brick, or crucible earth, or rather of iron, well luted within ſide, which muſt ſhut and open eaſily, and be very exact and fit, that the fire may not ſuck in any cold air, which might break the veſſels.

This furnace will ſerve alſo for many other uſes, as to melt, reverberate, calcine, cement, and ſeveral ſorts of work in the laboratory of *chymiſtry*; becauſe in it all the degrees of fire may be found, by the help of the lower opening, and the funnel of the chimney.

You may alſo for baking your China, make uſe of the furnace hereafter deſcrib'd, where we diſcourſe of painting on glaſs, putting thereinto your veſſel of crucible earth for baking the ware in, and then cover'd over with a vaulted coverlid, with a hole at top to let out the flame and ſmoke of the *reverberatory fire*; for this reaſon there will be no occaſion in this ſort of furnace for any other opening, becauſe the baking of veſſels with your ware, are put in at top before the coverlid is laid on, and ſo the fire circulates about it, and it becomes very red, whereby the China-ware is baked, as is done in baking of pipes.

To make the Stuff for CHINA-WARE. The compoſition for this muſt be very fine, becauſe of the ware, and not ſuch as is uſed for ordinary veſſels, we will therefore preſcribe the manner of making it, to prevent the unſucceſsful attempts of ſuch as may be ignorant.

For this you muſt take of ſhells of every ſort which are white and tranſparent, grind them well on a marble, then ſearce and reduce them to an impalpable powder.

To make your paſte of this powder, firſt diſſolve an ounce of very white *gum arabick* in a pail of water; when 'tis well diſſolv'd and mixt with the water, diſſolve therein about a quarter as much quick lime as your powder weighs; then ſtir and mix it very well, and afterwards put in the powder and ſtir all together, and knead it as they do mortar. Of this ſtuff form your veſſels, according to the different ſorts you deſire; let them half dry or more, in the air, before you poliſh them with your ſmooth inſtrument of copper or iron for that purpoſe, and ſo leave 'em until they dry thoroughly. Being very well ſmoothed and dried, glaze them over with your white enamel, prepared as hereafter directed, and ſo ſet them dry in the furnace to bake and finiſh; where having kept them a convenient time, let the fire go out of it ſelf. When the furnace is cold, take 'em out and paint them, and put them in again to bake a ſecond time, obſerving what directions have been already given concerning theſe matters; and when the fire is gone out, and the furnace cold, you have the ware in perfection ready to take out for uſe.

You may make your China-ware alſo of pure earth, let it not be red tho', but white or gray; you may try the ſufficiency of it after 'tis prepar'd, by baking ſome beforehand; and when it comes out of the furnace ſound and uncracked, 'tis good and fit for your purpoſe.

The preparation conſiſts in drying well, and reducing it to a very fine powder; then put it into fair water, wherein has been already diſſolv'd a little gum arabick; but moſt of thoſe that make it, employ only water without gum. After this, you make your diſhes, ſet 'em to dry, poliſh, glaze, bake, paint, and finiſh them as before; all which, thoſe who work at them know better than I can expreſs it.

How to Enamel CHINA. For this, take of the milk-white enamel, grind it very fine, as painters do their colours; put the powder afterwards into a glaſs cucurbit, pouring ſome *aqua-fortis* thereon; let it digeſt a little to cleanſe off its impurities, and become fine and tranſparent; then pour off the *aqua-fortis*, waſhing the powder in water over and over again; grind it afterwards with a little gum-water on your marble, and ſo glaze the veſſels with it within and without; dry them in the air, and bake them as before in the furnace.

Or you may heat the veſſels to a redneſs in the furnace, and melt the enamel: when it is in a perfect fuſion, dip the ſmaller veſſels therein, and pour of it on the larger, for they will take no more on them than will ſerve them; ſet them by turns in the furnace, ſtopping it very well to avoid the air; bake, cool your furnace, and finiſh them as before; then take out the diſhes, paint and bake them over again, obſerving all the former directions.

To paint CHINA. This is done as the enamel, but much more eaſily, the figures being only juſt daſh'd over in compariſon to them; however you muſt grind your colours with oil of ſpike on the marble, as has been already ſaid, and ſo paint on the diſhes ſtory, landſcape, or any other fancy: but you muſt never expect to have them ſo complete and handſome, as thoſe painted on the enamel'd plates, becauſe the former are finiſh'd ſtanding, and ſo enlarge in length or breadth; whereas the other are done on flats, and lying; beſides, the diſhes are for the moſt part round, and not ſo eaſily painted, for if they could be as neatly done as the enamel, they would be exceſſively dear.

To Gild CHINA. You muſt firſt grind ſome *ſhade-earth* on a marble, with linſeed-oil, prepar'd as ſhall be ſhewn anon, with which trace out your figures, which muſt be two whole days a drying; after this, apply very thin leaf-gold, and with a ſharp graver, ſhape the figures, and then put the diſhes in an oven, as ſoon as the batch of bread is drawn out; let the heat be no greater than one's hand may endure, elſe the veſſels would crack; leave them in it for two or three hours or more, if the oven be not too hot; you may elſe make uſe of your furnace, by giving it the ſame moderate degree of heat, as experienced perſons are well acquainted with.

Another way. This is much more handſome and lively, beſides that it can't be effaced; you may with it gild veſſels entirely, or border, or give them any luſtre you think convenient for ornament, and it will look as well as fine gold.

You muſt firſt wet over the places you would gild with gum-water lightly, then apply your leaves, and ſo let them dry: this is enough for plain gilding; but if you would have it carved or figured, you muſt make uſe of a ſteel graver, and afterwards bath the gold with water, wherein borax has been diſſolv'd, powdering it in the mean time with cryſtalline powder, or milk-white enamel reduc'd to a very fine powder; then ſet the diſh on a reverberatory fire to melt and be poliſh'd; thus you'll have as fine a piece of ware as can be.

The way to prepare Linſeed-oil for Gilding of CHINA. Take a *Paris* pint of linſeed-oil in an earthen pot which will hold about two *Paris* pints; put this on a fire, and when it begins to boil, throw in twice the bigneſs of a ſmall egg of *gum-arabick*

bick pulveriz'd; ſtir all well until it be diſſolved; then put in an onion of an ordinary ſize, and the like weight of garlick cut ſmall; when the oil boils well, and ſwells up by the force of the good fire which muſt be underneath, pour it out into another ſuch pot, and ſo in and out of each pot to the other, until all be very well mixt; then put it on the fire again, adding half an egg-ſhell of powder of maſtick, and ſtir it very well; as ſoon as it boils again, it will foam and have a great froth, which muſt be ſcumm'd off; and then take it off the fire, and brew the ingredients together, with the two pots as before; continue to do thus with it, or ſtir it on the fire, until it riſe no more.

This done, take a very dry toaſt of white bread to take off the greaſe (the oil ſtill boiling) and when you put in the toaſt, you muſt at the ſame time put in ſome pin-duſt; ſtir all together, and let it ſtand for twenty-four hours afterwards; ſtrain the oil through a linen-cloth, in which is ſome very fine ſand, the better to filtrate it, and take off the greaſe, and ſo you'll have it pure and clear, which bottle up for your uſe.

Or you may (both ways being good enough) firſt mix with the oil two ounces of gold litharge pulveriz'd, adding the gum arabick as ſoon as it begins to boil; and to purify it, let it filter through a linen-cloth full of ſand, while its hot, into a glaſs-bottle, wherein is already half an ounce of fine camphire powder, ſhaking the bottle very well until the oil be cold; afterwards lay it in the ſun for fifteen days, and it will be entirely purged, and the longer 'tis kept will be the better.

The imitation of CHINA *or* PORCELANE *ware upon tea-tables, tea-boards,* &c. *upon gold and ſilver grounds.* After the tables or other utenſils have been prepared as directed, mark out the deſigns upon them, make ovals or rounds upon them in a good diſpoſition, ſo as to be uniform, or well adapted to the deſign, that they may anſwer one another in a regular manner; then paſte on ſome paper in proper places, and when the paper is dry, draw your deſigns upon them, and paint them with water colours; then with a bruſh lay gold or ſilver ſize, and when that is near dry, lay on leaf gold or ſilver; and when all is dry'd, varniſh over with the ſtrongeſt varniſh, except only the ovals or circles of painting, for thoſe muſt be done with the white varniſh, which is ſo tranſparent, that all the painting will appear through it.

If you lay on a gold ground, or any colour darker than that, then let your painting be *blue* and *white*; or if it is ſilver or light ground, then uſe the moſt fiery colours in your paintings.

To take off the figure from any piece of CHINA-WARE, *tho' the perſon has not been acquainted with drawing.* If there be upon a diſh, plate, cup, &c. any figures that you like and would take off, you muſt lay a piece of oiled paper over them, ſo as to hold the piece ſteady till you can trace out the lines of the figures; then lay the oily paper on a paper black'd on one ſide, and the black'd paper on a clean paper; then trace the lines with a pen or blunted point of a needle, till the lines are all impreſs'd on the white paper, and draw them over with a black lin'd pencil, and mark the ſhades where they ſeparate from the light parts of the colour, that ſo you may lay on your colours as you ſee them painted on the *China*-ware; then cut out the figures cloſe to the out-lines, and fix them upon your ground of whiting and ſize, or ſize with ground chalk, with thick *gum arabick* and water; and when they are quite dry, paint them, the lighter parts in water colour, and the ſhady parts with varniſh mix'd with the darker colours; when theſe are dry, waſh all over with the white varniſh before the fire, but take care that it be not ſo nigh the fire as to make the varniſh riſe in bliſters.

When the varniſh is dry, lacker it again with the ſame varniſh, and repeat this a third time; then ſcrape ſome tripoli very fine, and with a ſoft rag dipt in water, take up a little of the *tripoli* at a time, and poliſh it by gentle rubbing till it is ſmooth; then waſh off the *tripoli* with a ſoft ſpunge and water, and then wipe it off with a dry fine cloth; and when it is thoroughly dry, if it be a white varniſh, clean it with whiting and oil; and if a black varniſh, with lamp black and oil.

But the common way is to cut out prints, and paſte them on ſuch parts as is thought fit, and then to colour them with water colours, and to varniſh them with white varniſh.

This is an eaſy way of painting, becauſe the ſhades of the prints, when you lay on a tranſparent water colour, will give the light and ſhade that colour to your purpoſe, without uſing a dark and light colour.

CHOLER is repreſented in painting by a meagre youth of a ſallow colour, with a haughty look, being almoſt naked; holding a drawn ſword in his right hand; on one ſide a ſhield with a flame in the middle, and a fierce lion on the other ſide.

Lean, becauſe heat predominates, which the ſhield denotes; his yellow colour ſhews his choler; the drawn ſword, his haſtineſs to fight; his nakedneſs and his impetuous paſſion does not ſuffer him to provide for himſelf: the lion his animoſity.

CHOROGRAPHY is repreſented in painting, &c. by a young lady in a changeable colour'd habit, plain and ſhort; in her right hand a meaſuring ſquare, a globe on the ground with a little part deſigned; in her left compaſſes.

The changeable habit denotes the different taking of ſituations; her ſhortneſs ſignifies the taking plans of dominions more briefly, when they take the leaſt part for the greateſt; the inſtrument, the taking by it the limits of every dominion; the compaſſes denote, the ſetting them to diſtinguiſh the confines from one another.

CHROMATICK [in painting] a term uſed to ſignify the colouring, which makes the third part of the art of painting.

CHRYSOLITE, a precious ſtone of a yellow colour. The *Chryſolite* is the *Topaz* of the moderns.

CHRYSOLITE, is alſo a general name which the ancients gave to all precious ſtones, in which the yellow or gold was the prevailing colour.

When the ſtone was green, they call'd it *Chryſopraſin*, the red and blue too had their particular denominations, which expreſs'd their colour, the gold being ſignified by *Chryſo*; which ſtill began the name.

The modern jewellers call that a *Chryſolite*, which the ancients call'd a *Topaz* or *Chryſopras*, which is a precious ſtone, green and diaphanous, ſome of which caſt a luſtre of gold; this ſtone is ſo hard, that it will eaſily endure the file, and ſometimes there are pieces of them found big enough to make ſtatues of, witneſs that of *Juba* King of *Mauritania*, made in honour of Queen *Arſinoe*, wife of *Ptolemæus Philadelphus*, of the height of four cubits.

To make a paſte for an oriental Chryſolite. To imitate this ſtone, take two ounces of natural cryſtal prepar'd, eight ounces of minium in fine powder, add to it twelve grains of *crocus Martis* made with vinegar, mixing the whole well together.

Then put the whole into a crucible, and ſet it in a furnace, leaving it there a little longer that it may have time to purify from the lead.

Then will you have a paſte for the oriental *Chryſolite*, which will appear very admirable, ſet with a foil in gold.

The way to make CHRYSOLITE. Take ten ounces of our powder of natural cryſtal and *Saturnus glorificatus*, (which ſee) to which add one ounce of *crocus martis* prepar'd; the whole reduc'd to fine powder, well mix'd, and put into a crucible covered and luted, and bake it as directed for other of the like metals, and you will have a fine *chryſolite colour*, which will be of the native green.

LODOVICO CIGOLI or CIVOLI, born in the year 1559, ſtudied *Andrea del Sarto* and *Correggio*; liv'd at *Florence* and *Rome*, excell'd in hiſtory, died in 1613, aged fifty four years.

GIOVANNI CIMABUE of noble deſcent, the father of the *firſt age* or infancy of modern painting, a diſciple of certain ordinary *Greek* painters brought to *Florence*, born in the year 1240, where he liv'd, excell'd in hiſtory and architecture, died in the year 1300, aged ſixty years.

He was of the family of the CIMABUE, in thoſe days reputed noble, and being a promiſing child was ſent to ſchool to the monaſtery of *Santa Maria novella*.

But inſtead of minding his book, he ſpent all his time in drawing of men, horſes and the like upon paper or the backſide of his books.

Much about this time thoſe who govern'd in *Florence*, invited ſome painters out of *Greece*, that the art of painting which was totally loſt by the deluge of calamities, which for divers hundred years had overwhelm'd *Italy*, and had ruin'd all the publick fabricks, and the product of the induſtry of the ancients, might be reſtor'd among the *Italians*.

There *Cimabue* following his ſecret inclination, us'd to get from ſchool, and paſs the whole day with thoſe painters to ſee them work. So that at laſt his father perceiving how fond he was of that art, agreed with the *Greek* painters to take him under their care, which they the more readily did, judging he was very likely to ſucceed in his profeſſion.

Accordingly, in a ſhort time, he ſurpaſs'd his maſters both in deſign and colouring, for they not at all attentive to improve their art, had contented themſelves with a plain, flat manner, as may be ſeen in thoſe of their works that have been preſerv'd to our time; but *Cimabue* though he imitated them, yet he had a much freer way, as appears by his works that remain.

CINNABAR, a mineral ſtone, red, heavy, and brillant, found chiefly in the quick-ſilver mines; call'd alſo vermilion.

The ordinary vermilion is nothing elſe but *Cinnabar* ground up with ſpirit of wine and urine.

Cinnabar, is either *native* or *factitious*.

The *native* or *mineral Cinnabar*, or vermilion, which is that above mentioned, is found in moſt places where there are quickſilver mines; yet it is true alſo, that it has mines of its own, thoſe in *Spain* are very famous; the *French* alſo have ſome of them in *Normandy*.

It may be eſteem'd as marcaſite of quickſilver, or rather as quickſilver petrified and fixt, by means of ſulphur and a ſubterraneous heat. Chymiſtry being found to reduce it without much trouble or loſs to the nature of mercury, each pound of *Cinnabar* yields fourteen ounces of mercury.

Accordingly, the principal property and uſe of this mineral, is to yield a moſt excellent mercury.

The beſt mineral *Cinnabar* is of a high colour, brillant and free from the ſtone.

Factitious or *artificial Cinnabar*, or vermilion is form'd of a mixture of mercury and ſulphur, ſublim'd and thus reduc'd into a kind of ſtone.

The beſt is of a high colour, full of fibres like needles.

The method of preparing factitious CINNABAR. They take ſix ounces of *ſulphur*, and eight of *quick-ſilver*, they mix them well, then ſet them on the fire till part of the ſulphur is conſum'd, and the powder remain black.

After this, it is ſublim'd once or twice in open pots, at the bottom of which the *Cinnabar* remains, very heavy, and ſtreak'd with the lines or needles, ſome red, others brillant like ſilver.

This is us'd by painters as a colour, it being a very vivid red, but not drying without ſome difficulty; *Cinnabar* or *Vermilion* is rendred more beautiful by grinding it with gum water, and a little ſaffron, thoſe two drugs preventing it from growing black.

There is likewiſe a BLUE CINNABAR, made by mixing two parts of *ſulphur* with three of quickſilver, and one of *ſal armoniac*; theſe being ſublim'd, produce a beautiful blue ſubſtance, whereas quickſilver and ſulphur alone produce a red.

To purify CINNABAR *or* VERMILION. *Cinnabar* being a compound of mercury and ſulphur, muſt be diveſted of the impurities it contracts from thoſe minerals, which impurities darken its luſtre, and cauſe it to change.

Grind *Cinnabar* in ſtone with fair water, on a marble or porphyry, put it into a glaſs or earthen veſſel to dry, then put urine to it, and mix it ſo that it be thoroughly wet and ſwim; then let it ſettle, and the *Cinnabar* being precipitated or fallen, pour off the urine by inclination, and put freſh in the room of it, leaving it ſo all night, and repeating the ſame change for four or five days, till the *Cinnabar* be thoroughly purified.

Continue the proceſs with beating up the white of an egg, which mixing with fair water, pour it upon the *Cinnabar*, and ſtir the whole about with a walnut-tree ſtick; change this liquor two or three times as above, and keep the veſſel cloſe ſtopp'd up, or cloſely covered for fear of duſt, which would ſpoil the *Cinnabar*, and when you would uſe it, temper it with gum water, with this it will not change its colour.

Another way. Firſt pulverize the *Cinnabar*, and then grind it on a porphyry with the urine of a child, or with brandy, and drie it in the ſhade.

If you would intirely diveſt it of all its obſcurities, and give it a brighter or redder countenance, infuſe in the brandy a little ſaffron, or put in a little urine and grind the *Cinnabar* with this liquor.

Of dying a Cinnamon colour.

I. *To dye a Cinnamon colour.* Take water a ſufficient quantity, *madder* a pound and half, nut galls a pound, fuſtick a pound, red wood two ounces, boil all in your cauldron, after enter twenty yards of cloth and handle it, boiling it ſtrongly two hours, cool it, and put into the liquor copperas four ounces; enter your cloth again; boil and handle, boil a quarter of an hour, and cool it, then put in copperas two ounces more; enter your cloth again, and handle it, and let it boil a quarter of an hour, then cool it, and it will be a good *Cinnamon* colour; the leſs copperas the lighter it will be, the more copperas the deeper.

II. *Another Cinnamon colour.* Take water a ſufficient quantity, dry rotten oak half a buſhel, madder two pounds, boil them well, and enter twenty yards of cloth; which handle well, and boil three hours, ſtill handling it; take it out of the cauldron and air it, and if need be, add a little more water to the dye, and put in copperas twenty four ounces; enter your cloth again, take it out and cool it, and if it is not ſad enough, put it in again with more copperas.

III. *Another way of dying Cinnamon colour.* Take water a ſufficient quantity, nut galls bruis'd ſmall four pounds, fuſtick, red wood ground, of each a pound, boil them all together; then enter your cloth and handle it well, for fear of ſpotting, and boil it two hours and cool it, then put in to ſadden it copperas two pounds; then it will dye forty eight or fifty pounds of wool, yarn, flannel, bays, cloth, *&c.*

IV. *Another Cinnamon colour.* Take water a ſufficient quantity, of madder two pounds, of red-wood ground a pound, boil them together for an hour; then enter forty pounds of wool, yarn, cloth, *&c.* and boil again an hour, take it up and air it, put in copperas three pounds; which when melted, put in the cloth again, make it boil.

V. *Another Cinnamon colour.* Take water a ſufficient quantity, cruſt madder three pounds, nut galls bruis'd ſmall, fuſtick, red-wood ground, of each a pound, rotten oak wood, tanners bark, of each half a pound; boil all together; then enter twenty yards of cloth, and boil an hour and half, after which cool and ſadden with copperas eight ounces, and if that deepens it not enough put in more.

VI. *Another Cinnamon colour.* Take water a ſufficient quantity, nut galls, *madder*, of each a pound, fuſtick twenty four ounces, redwood ground ſix ounces, boil and enter twenty yards of broad cloth, cool and ſadden with copperas four ounces.

CIVET, is a perfume produc'd by an animal call'd a *Civet Cat.*

This animal pretty much reſembles our *Cat*, excepting that its ſnout is more pointed, its claws leſs dangerous, and its cry different.

The perfume produc'd by this animal, is form'd like a kind of greaſe or thick ſcum in a ſort of bag under his tail. This *greaſe* is gathered from time to time, and ſtill abounds in proportion as the animal is fed.

Before any of theſe animals were ſeen in *Europe*, or it was known how the perfume was gathered, it was (according to the relations of travellers) ſuppos'd to be the ſweat of that animal irritated and kindled into a rage.

That the method of performing it, was by incloſing the animal in an iron cage; and whipping them a great while with rods, then gathering the ſweat or foam of the animal with a ſort of ſpoon, through the iron bars from between the thighs.

But ſince we have by experience been taught better, and that the perfume *Civet*, is only a thick unctuous humour, ſecreted by certain glands, between the two tunicks of the bag in which it is amaſs'd, under its tail, beneath the *anus*.

There is much *Civet* produc'd in *Baſſora*, *Calicut* and other places, where the animal that produces it is found. Though a great part of the *Civet* we have is furniſh'd by the *Dutch*, who keep and bring up a conſiderable number of *Civet Cats*.

Beſides the *Civet* from *India* and *Holland*, there is alſo from *Braſil* or *Guinea*, like that of *India*, and an occidental *Civet*, which bears no reſemblance to it.

Civet muſt be choſen new, of a good conſiſtence, a whitiſh colour, and a ſtrong diſagreeable ſmell.

Civet is adulterated by mixing with it the gall of an ox, and *ſtorax* liquified and waſh'd, or by the addition of honey of *Crete*.

Another way is, by taking the pure pulp of *raiſins* of the ſun four ounces, musk reduc'd to a fine powder half an ounce, which being well mixt together, nine ounces of *Civet* is added and mix'd again, and then digeſted in a bolt head in a ſand heat for twenty days; and when it is cold, it is taken out, ſtirred and mixed well together, and kept in a jar-glaſs cloſe covered with bladders.

Another way. Take liquid *ſtorax*, honey, ox-gall, fine pulp of figs of each an ounce and quarter, musk in fine powder half an ounce, choice *Civet* ten ounces; mix them well in a mortar, put them into a bolt head, and digeſt them for twenty days as before.

CLARO OBSCURO, }
CLAIR OBSCURE, } in painting is the art of diſtributing to advantage, the lights and ſhadows of a piece; both with regard
CHIARO SCURO, }
to the eaſing of the eye and the effect of the whole piece.

Thus when a painter gives his figures a ſtrong relievo, looſens them from the ground, and ſets them free from each other, by the management of lights and ſhadows, he is ſaid to underſtand the *Clair Obſcure.*

The *Claro Obſcuro* makes one of the great diviſions, or branches of painting, the whole of a picture being reſolvable into *light* and *ſhadow.*

The doctrine of *Clair Obſcure* will come under the following rules.

Light may be either conſidered in regard to itſelf, or to its effects, the place wherein it is diffus'd, or its uſe.

For the firſt light is either *natural* or *artificial*, *natural light* either comes immediately from the ſun, which is brisk, and its colour various according to the time of the day, or 'tis that of a clear air, thro' which light is ſpread, and whoſe colour is a little bluiſh, or a cloudy air which is darker; yet repreſents objects in their genuine colours with more eaſe to the eye.

Artificial light proceeds from fire or flame, and tinges the object with its own colour, but the light it projects is very narrow and confin'd.

For the ſecond, the effects of light are either *principal*, as when the rays fall perpendicularly on the top of a body without any interruption, or *glancing*, as when it ſlides along bodies, or *ſecondary*, which is for things at a diſtance.

3. For the *place*, it is either the open campagne, which makes objects appear with great ſoftneſs, or it is an inclos'd place, where the brightneſs is more vivid, its diminution more haſty, and its extremes more abrupt.

4. For the uſe or application, the light of the ſun is always ſuppos'd to be without, and over againſt the picture; that it may heighten the foremoſt figures, the luminaries themſelves never appearing, in regard the beſt colours can't expreſs them.

The chief light to meet on the chief group, and as much as poſſible on the chief figure of the ſubject.

The light to be purſued over the great parts, without being croſs'd or interrupted with little ſhadows.

The full force of the principal light to be only in one part of the piece, taking care never to make two contrary lights.

Not to be ſcrupulouſly confin'd to one univerſal light; but to ſuppoſe other acceſſory ones, as the opening of clouds, *&c.* to looſen ſome things and produce other agreeable effects.

Laſtly the light to be different, according to the quality of things, whence it proceeds, and the nature of the ſubjects which receive it.

As for *ſhadows*, they are diſtinguiſh'd,

1. Into thoſe form'd on the bodies themſelves, by their proper relievo's.

2. Thoſe made by adjacent bodies, thoſe that make the parts of any whole, and the different effects, according to the difference of places.

For the firſt, ſince the different effects of light only appear by ſhadows, their degrees muſt be well manag'd.

The place which admits no light, and where the colours are loſt, muſt be darker than any part that has relievo, and diſpos'd in the front.

The reflex or return of the light, brings with it a colour borrow'd from the ſubject that reflects it, and flies off at a greater or leſs angle, according to the ſituation of the reflecting body, with regard to the luminous one; hence its effects muſt be different in colour, and in force, according to the diſpoſition of bodies.

Deepenings which admit not of any light or reflex, muſt never meet on the relievo of any member of any great elevated part; but in the cavities or joints of bodies, the folds of draperies, *&c.* and to find occaſions for introducing great ſhadows, to ſerve for the repoſe of the ſight, and the looſening of things, inſtead of many ſhadows which have a pitiful effect.

For the ſecond, the ſhadows made by bodies, are either in plain and ſmooth places, or on the earth, wherein they are deeper than the bodies that occaſion them, as receiving leſs reflex light; yet ſtill diminiſh as they depart further from their cauſe, or on the neighbouring bodies, where they are to follow the form of the ſame bodies, according to its magnitude, and its poſition in reſpect to the light.

For the third, in ſhadows that have parts, the painter muſt obſerve to take for a light in a ſhadowed place, the teint or luſtre of the light part; and on the contrary, for the ſhadow in the lightened part, the teint or luſtre in the ſhadow; to make an agreeable aſſemblage of colour, ſhadow and reflex in the ſhadowed part.

But without interrupting the great maſſes of ſhadows, to avoid forming little things in the ſhadow, as not being perceiv'd unleſs cloſely look'd at; and to work as it were in the general, and at one ſight.

Never to ſet the ſtrong ſhadows againſt the light, without ſoftening the harſh contraſt by the help of ſome intermediate colour, though the maſs of light may be plac'd either before or behind that of the ſhadow; yet it ought to be ſo diſpos'd, as to illumine the principal parts of the ſubject.

For the fourth, the effects of ſhadows are different, as the place is either wide and ſpacious, as in thoſe coming immediately from the ſun, which are very ſenſible, and their extremes pretty abrupt; from the ſerene air, which are fainter and more ſweet, from the dark air, which appears more diffus'd and almoſt imperceptible; and thoſe from an artificial light, which makes the ſhadows deep, and their edges abrupt; or as it is more narrow and confin'd, where the lights coming from the ſame place, make the ſhadow more ſtrong, and the reflex leſs ſenſible.

CLAIR OBSCURE, CHAIRO SCURO, is alſo us'd to ſignify a deſign, conſiſting only of two colours, moſt uſually black and white; but ſometimes black and yellow, or it is a deſign only waſh'd with one colour, the ſhadows being of a dusky brown colour, and the lights heightened up with white.

The word is alſo apply'd to prints of two colours, taken off at twice; whereof there are volumes in the cabinets of the curious in prints.

The word *Clair-Obſcure* is a compound of two others, *Clair* is us'd by the *French* for thoſe parts of a painting which reflect the moſt light; and comprehends not only the lights themſelves, but alſo thoſe colours that are luminous.

By *Obſcure*, is meant not only all the ſhades, but alſo all the colours that are dusky.

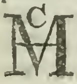
CLEARNESS is repreſented in painting, *&c.* by a naked youth of a noble aſpect, ſurrounded with a great ſplendour and brightneſs, with the ſun in his hand.

His youth ſhews him acceptable to every body, and is ſaid to be illuſtrious like the ſun that illuminates every thing in the world.

CLEOPHANTUS of *Corinth*, made the next improvement upon *Ardices* of *Corinth*, who firſt attempted to fill up his outlines. But as he did it with one ſingle colour laid on everywhere alike, his pieces, and thoſe of *Hygiemon*, *Dinias* and *Charmas* his followers, from thence got the name of *Monochromata* (*viz.*) pictures of one colour.

FRANCES *de* CLEYN was a *Dutch* painter and maſter of the tapiſtry works to King *Charles* I. at *Mortlack* for which he painted cartoons in diſtemper; he was very eminent for his invention, and made ſeveral deſigns that were extraordinary fine for painters, gravers, ſculptors, *&c.* amongſt which are cuts of ſome of *Ogilby*'s books. He died at *Mortlack* a little before the reſtoration.

CLIO, one of the muſes, the patroneſs and inventreſs of hiſtory, is repreſented in painting with a coronet of bays; holding in her right hand a trumpet, in her left hand a book, upon which may be written *Hiſtoria*. Her name is deriv'd from praiſe and glory.



HENRY DE CLIVEN, or DE CLEF, painter of *Antwerp*, uſed this mark; he died *anno* 1589. So alſo did *Martin de Clef.*

Cl. Mell. in *Sſ. Romæ* ſignifies *Claudius Mellanus.*

CLOUDS, SKY, *&c.* For colouring them, do as follows:

1. For a beautiful sky, fitted for fair weather, uſe *Bice* tempered with *white*, laying it in the upper part of the sky, (as you ſee proper) under which you may lay a thin or faint *purple* with a ſmall ſoft bruſh, working the undermoſt *purple* into the uppermoſt *blue*; but ſo as that the *blue* may ſtand clear and perfect.

2. For the horiſon, or near the ſame, lay a fine thin *maſticot*, which work from below upwards, till it mix with the purple; after which, you may take a ſtronger purple, making here and there upon the former *purple*, as it were the form of clouds as nature requires.

3. Upon the *maſticot*, you may alſo work with *minium* mix'd with *ceruſs*, to imitate the fiery beams, which often appear in hot and clear ſummer weather.

4. To imitate glory with a great ſhining light of a yellowiſh colour or the ſun-beams, you muſt uſe *maſticot* or *ſaffron* mixt with *red-lead*, and heightened with ſhell *gold* or the like.

5. A cloudy sky is imitated with pale *bice*, ſhading the clouds afterwards with a mixture of ſeveral colours; a fair sky requires clouds of a greater ſhade, with *purple*.

6. The *clouds* in a rainy sky muſt be ſhaded with *indigo* and *lake*; in a night sky, with *black* and dark *blue*, ſmoaky, making a blaze with purple, *minium* and *ceruſs*.

7. The *clouds*, at ſun riſing or ſetting, muſt be made with *minium*, *ceruſs* and purple, making ſcattering ſtrokes underneath the clouds with *minium* and *maſticot*, or *minium* and *ſaffron*; ſo that the ſcattering upward may appear faint, and ſomething fiery below afar off, near the landſcape.

8. Make a fiery sky with pale blue, ſmoothing it downwards, which muſt be afterwards mingled with a ſtrong *red-lead* mixt with *ceruſs*, making long diminutive ſtrokes like the ſun-beams upon the blue sky, with which let fall ſome purple ſtrokes, much like the ſaid beams; then ſweeten one into another with a ſoft bruſh-pencil, wet in gum-water, not too ſtrong.

9. Make a fair sky, by uſing fair *bice* alone, and tempering it by degrees with more and more white; ſmoothing one into the other from above downwards, and ſhading it as you think proper, and as nature requires.

Of dying CLOVE *colour.*

I. *To dye an excellent* Clove *colour.* Take water a ſufficient quantity, *fuſtick* twenty four ounces, *cruſt madder* and *nut galls* of each a pound, *red wood* ground four ounces; boil them, and enter twenty yards of broad cloth; boil it two hours with a ſtrong heat, handling it; then put in *copperas* half a pound, *oak* *ſhavings* four ounces; enter your cloth again, handle it well, boil it half an hour, and ſo cool it; if you would have the colour ſadder, put in more *copperas.*

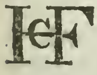
II. *Another* Clove *colour.* Take water a ſufficient quantity, joiners oak ſhavings four pounds, *madder* two pounds, *redwood* and *walnut tree leaves* of each four ounces; boil them well, and enter twenty yards of cloth, which handle well, and boil it three hours, ſtill handling it; then take it out and air it, adding, if need requires, a little more water; then take *copperas* thirty ounces, enter your cloth again, take it out and cool it, and ſadden it, if need requires, with more *copperas.*

III. *Another* Clove *colour.* Take water a ſufficient quantity, *nut galls* and *red wood* ground of each a pound, *fuſtick* and *madder* of each eight ounces, *ſumach* four ounces; boil all theſe together for an hour, then enter your cloth, *&c.* and boil an hour; take it out, and put in *copperas* two pounds; being melted, put in your cloth again, and let it boil. This will dye twenty pounds weight of wool, yarn, cloth, *&c.*

IV. *Another* Clove *colour.* Take water a ſufficient quantity, *ſumach* ſix handfuls, *fuſtick* three handfuls, *red wood* ground one handful; boil all theſe two hours and a half, with twenty yards of broad cloth; then cool and ſadden with *copperas,* as you ſee fit.

V. *Another* Clove *colour.* Take water a ſufficient quantity, *nut galls* two pound, *madder* two pounds, *fuſtick* a pound and a half; boil all together, cool with a little water, then enter forty eight or fifty pounds of wool, yarn, cloth, *&c.* handle your cloth, and boil it two hours and a half; then cool it, and ſadden with *copperas* two pounds four ounces.

DON GIULO CLOVIO, born 1498, ſcholar of *Giulo Romano,* liv'd at *Rome* and in *Hungary*; excell'd in miniature, hiſtory and portraits; died in the year 1578, aged eighty years.



HERMAN COBLENT has put this mark under the four Evangeliſts and other plates; one of *David,* of *Judith* and *Lucretia*; and afterwards *Adrianus Hubertus* uſed this mark with *excudit.*

COCHINEAL, a drug us'd by dyers in giving red colours, eſpecially crimſons and ſcarlets.

It is brought to us from the *Weſt-Indies,* but authors are not agreed as to its nature; ſome taking it to be the grain of a tree, and others to be a kind of worm.

Of the firſt opinion is *Pomet,* and of the latter *F. Plumier.*

But it ſhould ſeem that there is both a *Cochineal* that is a grain, and another that is a worm, tho' they have both been equally diſtant from the truth in the deſcription they have given of it.

This opinion is founded on the account given by *Dampier*, who gives a preciſe deſcription of each kind; which if be not true, 'tis at leaſt more likely than any opinion yet propos'd. His deſcription of each is as follows.

The *Cochineal worm* is an inſect ingendred in a fruit, reſembling a pear; the ſhrub which bears it is five or ſix foot high. At the top of the fruit grows a red flower, which when mature, falls on the fruit; and that opening diſcovers a cleft two or three inches in diameter. The firſt then appears full of little red inſects, having wings of a ſurprizing ſmallneſs, and which would dye and rot there if not taken out.

The *Indians* therefore ſpreading cloths under the tree, ſhake it with *Poles*, till the inſects are forc'd to quit their lodging, and fly about the tree; which they cannot do many moments, but tumble down dead into the cloth, where they are left until they be entirely dry. When the inſect flies, it is red; when it is fallen, black; and when dry, white, though it afterwards changes its colour.

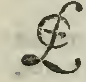
There are whole plantations of the *Cochineal* tree, or *Tonna*, as the natives call it, about *Guatimala*, *Chepe*, and *Guexach* in the kingdom of *Mexico*.

Cochineal grain, or as *Dampier* calls it, *Sylveſtris*, is a red berry, growing in *America*, found in a fruit, reſembling that of the *Cochineal* tree or *Tonna*.

The firſt ſhoots produce a yellow flower; then comes the fruit which is long, and when ripe, opens with a cleft of three or four inches. The fruit is full of pippins or grains, which fall on the leaſt agitation, and which the *Indians* take care to gather. Eight or ten of theſe fruits may yield about an ounce of grain.

This berry yields a dye, almoſt as beautiful as that of the inſect; and a perſon may eaſily be deceived in them, though the firſt is the leaſt eſteem'd by much.

VIVANO CODAZZO, call'd VIVIANE, call'd DALLE PROSPECTIVE, born in the year 1599, ſcholar of *Auguſtino Taſſo*, liv'd at *Rome*, excell'd in buildings and ruins, died in the year 1674, aged ſeventy five years.



STEPHEN COLBENSTAGH, *Sc. Romæ.* He engrav'd the paintings of *Domenichene*, and uſed this mark.

ADAM COLONI, commonly call'd *the Old*, was a *Dutch* painter, born in *Roterdam*, but who reſided a great while in *England*, and became eſpecially eminent for his ſmall rural pieces, cattel, country wakes, fire pieces, *&c.* he alſo copied many pictures of beaſts after *Baſſano*, particularly thoſe of the royal collection, which are eſteemed his beſt performances. He died in

London in 1685, and lies buried in St. *Martin*'s Church, aged fifty one years.

HENRY, *alias* ADRIAN COLONI, was the ſon of the forementioned, he was inſtructed by his father and brother-in-law Mr. *Van Dieſt*, and became a good draftſman, as a great number of academy pieces drawn by him teſtify; he often wrought upon the ſmall figures of his brother *Van Dieſt*'s landſcapes, and they received no ſmall addition of beauty from what he did, eſpecially when he ſtrove to imitate the manner of *Salvator Roſa.* He died young about the year 1701, at thirty three years of age, and lies buried in St *Martin*'s Church. He was a perſon of lively invention, and painted very quick.

COLOUR is defined to be a property inherent in light, whereby, according to the different ſizes or magnitudes of its parts, it excites different vibrations in the fibres of the optic nerve, which being propagated to the *ſenſorium*, affects the mind with different ſenſations.

Or it is defined to be a ſenſation of the ſoul, excited by the application of light to the *retina* of the eye, and different as that light differs in the degree of its refrangibility, and the magnitude of its component parts.

So that in the former view, *light* is the ſubject of *Colour*, and in the latter it is the agent.

The opinions of authors, both antient and modern, have been various, with reſpect to the nature and origin of the phænomenon of *Colour*.

The moſt popular opinion is that of the followers of *Ariſtotle*, who maintain'd that colour was a quality reſiding in the *colour'd* body, and that it does exiſt independently of light.

The *Carteſians* came indeed ſomething nearer to the truth, who owned, that as the colour'd body is not immediately apply'd to the organ, to occaſion the ſenſation, and that as no body can affect the ſenſe but by immediate contact; the colour'd body does not excite the ſenſation of it ſelf, or contribute any thing to it, otherwiſe than by moving ſome interpos'd medium, and by that the organ of light.

They add, that as we find that bodies don't affect the ſenſe in the dark, light only occaſions the ſenſe of *Colour*, by moving the organ; and that *colour'd* bodies are no further concern'd, than as they reflect the light with a certain modification; the differences in their colours ariſing from a difference in the texture of their parts, whereby they are diſpos'd to reflect the light with this or that modification.

But 'tis to the incomparable Sir *Iſaac Newton* we owe a ſolid and conſiſtent theory of *colours*, built on ſome experiments, and ſolving all the *phænomena* thereof. His doctrine is as follows.

It is found by experience, that rays or beams of light are compos'd of particles very heterogeneous, or diſſimilar to each other, *i. e.* ſome of them, as it is highly probable, are larger, and others leſs.

For a ray of light, as E F (See plate fig. VI.) being receiv'd on a refractory ſurface, as A D in a dark place is not wholly refracted to L, but ſplit as it were, and diffus'd into ſeveral little rays; ſome of which are refracted to L, and others to the other intermediate points between L and G, *i. e.* thoſe particles of the light, which are the moſt minute, are of all others the moſt eaſily and moſt conſiderably diverted; by the action of the refracting ſurface out of their rectilinear courſe towards L: and the reſt, as each exceeds another in magnitude, ſo is it with more difficulty and leſs conſiderably turn'd out of its right line to the points betweeen L and G. See REFRANGIBILITY.

Now each ray of light, as it differs from another in its degree of refrangibility, ſo does it differ from it in *Colour*; this is warranted by numerous experiments.

Thoſe particles v. g. which are moſt refracted, are found to conſtitute a ray of a violet colour, *i. e.* in all probability, the moſt minute particles of light, thus ſeparately impell'd, excite the ſhorteſt vibrations in the *retina*, which are thence propagated by the ſolid fibres of the optic nerves into the brain, there to excite the ſenſation of violet *colour*; as being the moſt dusky and languid of all *Colours*. See VIOLET.

Again thoſe particles which are the leaſt refracted, conſtitute a *radiclus* or ray of a red *Colour*, i. e. the largeſt particles of light excite the longeſt vibrations in the *retina*, ſo as to excite the ſenſation of a red *Colour*, the brighteſt and moſt vivid of all *Colours*. See RED.

The other particles being in like manner ſeparated according to their reſpective magnitudes into little rays, excite the intermediate vibrations; and thus occaſion the ſenſation of the intermediate colours, much in the ſame manner as the ſeveral vibrations of the air according to their reſpective magnitudes, excite the ſenſation of different ſounds.

To this it may be added, that not only the more diſtinct and notable *Colours* of *red*, *yellow*, *blue*, &c. have thus their riſe from the different magnitudes and refrangibility of the rays; but alſo the intermediate degrees or teints of the ſame colour, as of *yellow* up to *green*, of *red* down to *yellow*, &c.

Further, the *Colours* of theſe little rays not being any adventitious modifications thereof, but connate, primitive and neceſſary properties, as conſiſting in all probability, in the magnitudes of their parts, muſt be perpetual and immutable, *i e.* cannot be changed by any future refraction or reflection, or by any modification whatſoever.

This is confirm'd by abundance of experiments; all endeavours having been uſed, after ſeparating a *colour'd* ray from thoſe of other kinds, to change it into ſome other *Colour* by repeated refractions, but to no effect.

Apparent tranſmutations of *Colours* indeed may be effected, *viz.* where there is an aſſemblage or mixture of rays of different kinds, the component colours never appearing in their natural hue in ſuch mixtures; but always allay'd and temper'd with each other; whence reſults a middling kind of colour, which by refraction may be ſeparated into component ones; and thoſe after ſeparation being remix'd, return to their former *Colour.*

Hence the tranſmutations of *Colours*, by mixing thoſe of different kinds, are not real; but mere appearances and deceptions of the ſight: for the rays being again ſevered, exhibit the ſame colours as at firſt. Thus blue and yellow powders well mixt, appear to the naked eye green; yet without having paſs'd any alteration, when view'd through a microſcope, the blue and yellow particles ſtill appear diſtinct.

Hence there ariſe two kinds of colours, the one *original* and *ſimple*, produc'd by homogeneal light, or by rays that have the ſame degree of refrangibility, and the ſame magnitude of their parts; ſuch as *red*, *yellow*, *green*, *blue*, a *violet*, *purple*, *orange*, and *indigo*, with all their intermediate teints and gradations.

The other kind of *Colours* is *ſecondary* or *heterogeneous*, compounded of the primary ones; or of a mixture of rays differently refrangible, *&c.*

There may alſo be ſecondary colours, produc'd by compoſition like the primary ones, or thoſe conſiſting of homogeneal light, as to the ſpecies or appearance of the *Colour*; but not as to the permanency or immutability thereof. Thus *yellow* and *blue* make *green*; *red* and *yellow*, *orange*; *orange* and *yellowiſh green*, *yellow*; and in the general, if any two *Colours* be mix'd, which in the ſeries of thoſe generated by the priſm, are not too far apart from their mixture, reſults that *colour*, which in the ſaid ſeries is found in the mid way between them; but thoſe ſituated at too great a diſtance, do not ſo.

Indeed, the more any *Colour* is compounded, the leſs perfect and vivid it is; by too much compoſition, they may be diluted and weakened, till they ceaſe.

By compoſition, there may be produced *Colours*, not unlike any of thoſe of the homogeneal light.

The moſt extraordinary compoſition is that of whiteneſs, for to this, all the primary colours abovementioned are required; and thoſe to be mixt in a certain degree.

Hence it is that white is the ordinary *colour* of light; light being nothing elſe but a confus'd aſſemblage of rays of all *Colours*.

If the rays of different *Colours* do thus begin to be ſeparated by one refraction of one ſingle ſurface, that ſeparation is much promoted, ſo as even to become ſenſible to the eye by a double refraction.

This is obſerv'd in the two ſurfaces of any glaſs; provided thoſe ſurfaces, be not parallel, but of all others, it is moſt ſenſible in the two faces of a triangular priſm; the phænomena whereof, as they are the touchſtone of all theories of *Colours*, and as they contain the theory of that is here delivered, we ſhall lay down as follows.

1. The rays of the ſun, tranſmitted through a triangular priſm, exhibit an image of various *Colours* (the chief of which are *red*, *yellow*, *green*, *blue* and *violet)* on the oppoſite wall.

The reaſon is, that the differently colour'd rays are ſeparated by refraction; for the blue rays v. g. mark'd with the dotted line (See plate fig. VII.) which begin to be ſeparated from the reſt, by the firſt refraction in *d d* of the ſide *c a* of the priſm *a b c* (as alſo in the firſt ſurface of the globe of water *a b c*, fig. VIII.) are ſtill further ſeparated in the other ſide of the priſm *b c*, (as alſo in their egreſs out of the globe *a b c*) by a ſecond refraction in *c e*, in the ſame direction as the former: whereas on the contrary, in the plane glaſs *e b c f*, fig. X. (as alſo in the priſm *g l o*, fig. IX. now plac'd in another ſituation) thoſe blue rays which begin to be ſeparated from the reſt in the firſt ſurface in *d d* by a ſecond refraction, the contrary way paſs out parallel, *i. e.* remix'd with all the *colours* of the other rays.

2. That image is not round, but oblong; its length, when the priſm is an angle of ſixty or ſixty five degrees, being five times its breadth.

The reaſon is, that ſome of the rays are refracted more than others; and by that means exhibit ſeveral images of the ſun extended lengthwiſe, inſtead of one.

3. Thoſe rays which exhibit yellow, are turn'd further from the rectilinear courſe, than thoſe which exhibit *red*, thoſe which exhibit *green*, than thoſe which exhibit *yellow*; but of all others, thoſe which exhibit *violet* the moſt.

Accordingly, if the priſm, thro' which the light is tranſmitted, be turn'd about its axis, ſo as the *red*, *yellow*, *green*, &c. rays be projected in order, thro' a narrow aperture into another priſm, plac'd at the diſtance of about twelve feet; the *yellow*, *green*, &c. rays, though falling through the ſame aperture in the ſame manner, and on the ſame point of the ſecond priſm, will not be refracted to the ſame place as the *red*; but to a point at ſome diſtance from it, on that ſide to which the rotation is made.

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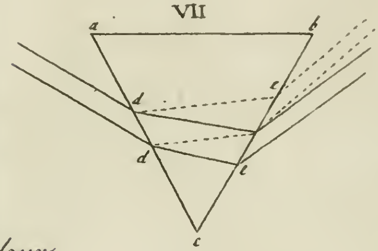
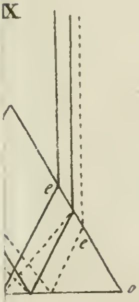
ect K. *Vol.* I. *to face the* VIIth *leaf.*

VII



olours.

IX



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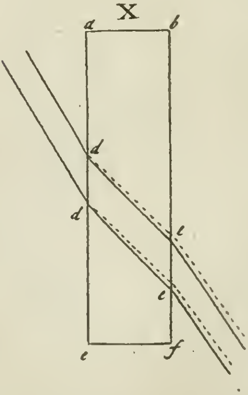

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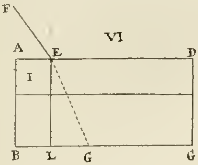
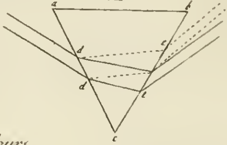
VI

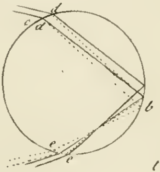


VII

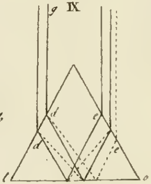


Colours.

VIII.



IX



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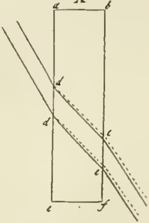

This is what Sir *Iſaac Newton* calls the *experimentum crucis*; being that which led him out of the difficulties into which the firſt phænomenon, *&c.* had thrown him, and plainly ſhew'd a different degree of refrangibility, and a different *Colour* correſponding thereto in the rays of light; and that yellow rays, v. g. are more refracted than *red* ones, *green* ones more than *yellow* ones, and *blue* and *violet* ones moſt of all.

4. The *Colour* of *colour'd rays* well ſeparated by the priſm, are not at all chang'd or deſtroy'd by paſſing an illuminated medium, nor by their mutual decuſſation, their bordering on a deep ſhadow; nor their being reflected from any natural body, or refracted through any one, in a place howſoever obſcure.

The reaſon is, that *Colours* are not modifications ariſing from refraction or reflection, but immutable properties; and ſuch as belong to the nature of the rays.

5. An aſſemblage of all the kinds of *colour'd* rays, collected either by ſeveral priſms, by a convex lens or a concave mirror, or in any other manner, from what we call whiteneſs; yet each of theſe after decuſſation, becoming ſeparated again, exhibits its proper *Colour:* for as the ray was white before its parts were ſeparated by refraction; ſo the parts being re-mix'd, it becomes white again, and colour'd rays when they meet together, don't deſtroy one another, but are only interſpers'd.

Hence a *red*, *green*, *yellow*, *blue* and *violet Colour*, being mixt in a certain proportion appear *whitiſh*, i. e. are of ſuch a *Colour* as ariſes from white and black mix'd together; and if there were not ſome rays abſorb'd and loſt, would be plainly white.

In like manner, if a paper cut into a circle, be ſtain'd with each of thoſe *Colours* ſeparately, and in a certain proportion; then ſwiftly turn'd round its centre, ſo that the ſpecies of *Colours* be mixt together in the eye, by the briskneſs of the motion, the ſeveral *Colours* will diſappear, and the whole paper appear of one continued *Colour*; which will be a mean between *white* and *black*.

6. If the rays of the ſun fall very obliquely on the inner ſurface of a priſm, thoſe that are reflected will be of a *violet Colour*; thoſe that are tranſmitted *red*.

For the rays were *colour'd* before any ſeparations, and by how much they are the more refrangible, by ſo much they are the more eaſily reflected; and by that means are ſeparated.

7. If two hollow priſms, the one being fill'd with a *blue* fluid, and the other with a red one be joined together; they will be opake, though each being apart will be tranſparent.

For the one tranſmitting none but blue rays, and the other none but red ones, the two together will tranſmit none at all.

8. All natural bodies, eſpecially white ones, view'd through a priſm held to the eye, appear fimbriated or bordered on one ſide with *red* and *yellow*; and on the other with *blue* and *violet.*

For thoſe *fimbria* are the extremes of intire images which the rays of any kind, as they are more or leſs refracted, would exhibit nearer or at a greater diſtance, from the real place of the object.

9. If two priſms be ſo plac'd, as that the *red* of the one, and the purple of the other meet together in a paper fit for the purpoſe, incompaſs'd with darkneſs; the image will appear pale, and if view'd through a third priſm, held to the eye at a proper diſtance, it will appear double, the one red, and the other *purple.*

In like manner if two powders, the one perfectly *red*, and the other blue, *red* and *purple* be mix'd; any little body cover'd pretty deeply with this mixture, and view'd through a priſm held to the eye, will exhibit a double image, the one *red* and the other *blue*; by reaſon that the *red* and *purple*, or *blue* rays are ſeparated by their unequal refraction.

10. If the rays tranſmitted through a *convex lens* be receiv'd on a paper, before they meet in a *focus*; the confines or boundary of light and ſhadow will appear ting'd with a *red Colour*; but if they be receiv'd beyond the *focus*, with a *blue* one.

Becauſe in the firſt caſe, the red rays being ſomething more refracted, are the higher; but in the ſecond after decuſſation in the *focus*, the blue ones.

Laſtly, if the rays about to paſs through either ſide of the *pupilla*, be intercepted by the interpoſition of any opake body near the eye; the extremes of bodies plac'd, as if view'd through a priſm, will appear ting'd with *Colours*, though thoſe not very vivid.

For then the rays tranſmitted through the reſt of the *pupilla*, will be ſeparated by refraction into *Colours*, without being diluted with the admixture of the intercepted rays, which would be refracted in a different manner.

And hence it is, that a body, view'd through a paper, pierc'd with two holes, appears double and alſo ting'd with *Colours.*

Of the COLOURS *of thin plates.* As rays of different *Colours* are ſeparated by the *refraction* of *priſms*, and other thick bodies; ſo are they ſeparated, though in a different manner in the thin *lamellæ* or plates of any pellucid matter, v. g. the bubbles rais'd in water thickned by ſoap, *&c.*

For all *lamellæ* under a determinate thickneſs, tranſmit rays of all *Colours*, without reflecting any at all, but as they increaſe in thickneſs, in arithmetical proportion, they begin to reflect firſt *blue* rays; then in order *green*, *yellow* and *red*, more and more mixt and diluted, till at length, arriving at a certain thickneſs, they reflect rays of all *Colours*, perfectly intermixt with white.

But in whatſoever part a ſlender *lamellæ* reflects any one colour, v. g. *blue*, in that part it always tranſmits the oppoſite colours, v. g. *red* or *yellow*.

It is found by experiment, that the difference of *Colour* of a plate, does not depend upon the medium that encompaſſes it, but the degree of vividneſs does; *cæteris paribus*, the *Colour* will be more vivid, if the denſer medium be encompaſs'd with a rarer.

A plate, *cæteris paribus*, reflects more light, as it is thinner, as far as a certain degree of thinneſs; beyond which, it reflects no light at all.

In plates, the thickneſs of which increaſe in an arithmetical progreſſion of the natural numbers, 1, 2, 3, 4, 5, *&c.* If the firſt or thinneſt reflect any homogeneal ray, the ſecond will tranſmit it, and thus is the ſame ray alternately reflected and tranſmitted, *i. e.* the plates correſponding to the odd numbers, 1, 2, 3, 5, 7, *&c.* will reflect the ſame rays, that thoſe correſponding to the even ones, 2, 4, 6, 8, *&c.* tranſmit.

Hence an homogeneous *Colour* in a plate is ſaid to be of the *firſt order*; if the plate reflect all the rays of that *Colour*. In a plate, whoſe thinneſs is in a threefold proportion to the firſt, it is ſaid to be of the *ſecond order*, in another, whoſe thinneſs is five times that of the firſt, it is ſaid to be of the third order, *&c.*

A *Colour* of the firſt order, is the moſt vivid of any, and ſucceſſively the vividneſs of the *Colour* increaſes, as the quantity of the order increaſes; the more the thickneſs of the plate is increaſed, the more *Colours* it reflects; and thoſe of more different orders.

In ſome plates the *Colour* will vary as the poſition of the eye varies, in others it is permanent.

COLOURS *of natural bodies.* Bodies only appear of different *Colours*, as their ſurfaces are diſpos'd to reflect rays of this or that *Colour* alone, or of this or that *Colour* more abundantly than any other; hence bodies appear of that *Colour* which ariſes from the mixture of the reflected rays.

All natural bodies conſiſt of very thin, tranſparent *lamellæ*; which if they be ſo diſpos'd in regard to each other, as that there happen no reflections or refractions in their interſtices, thoſe bodies become pellucid or tranſparent, but if their intervals be ſo large, and thoſe are fill'd with ſuch matter; or ſo empty (in reſpect to the denſity of the parts themſelves) as that there happen a number of reflections and refractions within the body, the body in that caſe becomes opake.

The rays which are not reflected from an opake body penetrate into it, and there ſuffering innumerable reflections and refractions at length unite themſelves, to the particles of the body itſelf.

Hence an opake body grows hot the ſooner, as it reflects light leſs copiouſly; whence we underſtand the reaſon why a white body, which reflects almoſt all the rays that ſtrike upon it, heats much more ſlowly than a black one, which reflects ſcarce any.

In order to determine that conſtitution of the ſurface of bodies, wherein their *Colour* depends; it muſt be obſerv'd, that the ſmalleſt corpuſcles or firſt particles of which ſurfaces are made up, are moſt thin and tranſparent, and ſeparated by a medium of a different denſity from the particles themſelves.

So that in the ſurface of every *colour'd* body are innumerable ſmaller, thin plates, correſponding to thoſe of bubbles; wherefore, what has been obſerv'd of thoſe may be underſtood of theſe.

Hence it is gathered, that the *Colour* of a body depends upon the denſity and thickneſs of the parts of the body, between the pores of the ſurface, that the colour is more vivid and homogeneous, as the parts are thinner; that *cæteris paribus* the ſaid parts are the thickeſt when the body is red, and the thinneſt when *violet*; that the parts of bodies are uſually much denſer, than the medium contain'd in their interſtices; but that in the tails of peacocks, ſome ſilks, and generally, in all bodies whoſe *Colour* varies, according to the ſituation of the eye, it is leſs; and that the *Colour* of a body is the leſs vivid to the eye, as it has a denſer medium within its pores.

Now of the ſeveral opake bodies, thoſe conſiſting of the thinneſt *lamellæ* are *black*, thoſe conſiſting either of the thickeſt *lamellæ*, or of *lamellæ* very different from each other in thickneſs, and on that account fitted to reflect all *Colours*, as the froth of water, *&c.* are white.

Thoſe again conſiſting of *lamellæ*, moſt of which are of ſome intermediate thickneſs, are *blue*, *green*, *yellow* or *red*, inaſmuch as they reflect the rays of that particular *Colour*, much more copiouſly than that of any other *Colour*; moſt of which laſt they either abſorb or extinguiſh, by intercepting them, or elſe they tranſmit light.

Hence it is, that ſome liquors, v. g. an infuſion of *lignum nephriticum* appear *red* or *yellow*, if view'd by reflected light, and *blue* by tranſmitted light; and leaves of gold *yellow* if view'd by reflected light, but *green* or *blue* in the latter.

To this we may add, that ſome of thoſe powders, us'd by painters, have their *Colour* chang'd by being very finely ground; which muſt be caus'd by the commination, or breaking o

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their ſmall parts into others ſtill ſmaller, juſt as a *lamella* has its *Colour* altered by altering its thickneſs.

In ſhort, thoſe odd phænomena ariſing from the mixture of liquors of different *Colours*, can no way be better accounted for, than from the various actions of the ſaline, *&c.* corpuſcles of one liquor with the coluored corpuſcles of another; if they unite, the maſs will either ſwell or ſhrink, and thereby its denſity will be altered; if they ferment, the ſize of the particles may be diminiſhed, and thereby the coloured liquor may become tranſparent; if they coagulate, an opake liquor may be produc'd of two tranſparent ones.

Hence it is eaſy to conceive, why a colour'd liquor in a glaſs of a conical figure, plac'd between the *eye* and the *light*, appears of a different *Colour* in different parts of the veſſel; there being more and more rays intercepted, as they paſs through a longer or ſhorter ſection of the veſſel, till at the baſe they are all intercepted, and none ſeen but thoſe that are reflected.

From the various *Colours* of natural bodies, Sir *Iſaac Newton* obſerves, the bigneſs of their component parts may be eſtimated; for that the parts of bodies do properly exhibit the ſame *Colour* with a *lamella* of equal thickneſs provided the denſity in both be the ſame.

The ſeven Painting COLOURS *in general*

I. The chief *whites* are *ſpodium*, *ceruſs*, *white-lead*, *Spaniſh white*, *egg-ſhells* burnt.

The *Spaniſh white* is thus made:

Take fine *chalk* ſix ounces, *allum* two ounces, grind them together in fair water, till it be like pap, roll it up into balls which dry leiſurely; then put them into the fire till they are red hot, take them out and let them cool.

This is the beſt white of all to garniſh with, being ground with weak gum water.

2. The chief *blacks* are theſe; *harts-horn* burnt, *ivory* burnt, *lamp-black*, *charcoal*, *ſea-coal*, *verditer* burnt, *mummy* burnt.

3. The chief *reds* are theſe; *carmine*, *vermilion*, *red-lead*, *Indian lake*, native *cinnabar*, *red-oaker*, *yellow-oaker* burnt, *Indian-red.*

4. The chief *greens* are theſe; *green bice*, *green pink*, *verdegreaſe*, *verditer*, *ſap-green*, *pink*, mixt with *bice.*

5. The chief *yellows* are theſe; *orpiment*, *maſticote* deep and light, *ſaffron*, *pink yellow*, dark and light, *oker de luce*, *Engliſh-oaker*, *Roman-oaker*, *gall-ſtone.*

6. The chief *blues* are theſe; *ultramarine*, *indigo*, *ſmalt*, *blue-bice.*

7. The chief *browns* are theſe; *umber*, *Spaniſh-brown*, *Colen*'s *earth*, *gall-ſtone*, *ruſt of iron*, *mummy.*

This is to be noted, that of the *Colours* before named, *vermilion*, *verdegreaſe*, *orpiment*, and ſome others are too coarſe and gritty to be us'd in water colours, unleſs they be purified and prepar'd.

And *turnſole*, *litmoſe blue*, *roſet*, *braſil*, *logwood* and *ſaffron* are more fit for waſhing prints, than curious limning.

COLOURS in painting is a term apply'd both to the drugs, and the teints produc'd by thoſe drugs, variouſly mixt and apply'd.

The principal *Colours* us'd by painters are *red* and *white-lead* or *ceruſs*, *yellow* and *red oakers*; ſeveral kinds of earth, as *umber*, *orpiment*, *lamp-black*, burnt *Ivory*, *black lead*, *cinnabar* or *vermilion*, *gamboge*, *lacca*, *blue and green aſhes*, *verdegreaſe*, *biſtre*, *bice*, *ſmalt*, *carmine*, *ultramarine*; each of which with the manner of preparing them, their uſes, *&c*, are to be found under their proper articles.

Of theſe colours ſome are us'd tempered with gum water, ſome ground with oil; others only in *freſco*, and others for miniature; all which ſee under their proper heads.

Painters reduce all the *Colours* they uſe under theſe two claſſes, of *dark and light* COLOURS.

Dark Colours are black, and all others that are obſcure and earthy, as *umber*, *biſtre*, &c.

Under *light Colours* are comprehended *white*, and all thoſe that approach neareſt it.

Painters alſo diſtinguiſh COLOURS into *ſimple* and *mineral.*

Under *ſimple Colours* they rank all thoſe which are extracted from vegetables, and which will not bear the fire, as the *yellow*, made of *ſaffron*, *French bernes*, *lacca*, and other tinctures extracted from flowers, us'd by limners, illuminers, *&c.*

The *mineral Colours* are thoſe which are drawn from metals, *&c.* and that are able to bear the fire: us'd by enamellers.

Changeable and permanent COLOURS, is another diviſion, which, by ſome, is made of *Colours.*

Changeable Colours are ſuch as depend on the ſituation of the objects with reſpect to the eye, as that of a pigeon's neck, taffeta's, *&c.* the firſt however, being attentively view'd with a microſcope, each fibre of the feathers appears compos'd of ſeveral little ſquares, alternately *red* and *green*; ſo that they are fix'd *Colours.*

Kircher ſays, that the changing, *i. e.* changeable *Colour* obſerv'd in the wings of pigeons, peacocks, *&c.* ariſes from the feathers being tranſparent, and of a figure reſembling a priſm; and conſequently the lights being differently refracted from them, and

Permanent Colours are not exhibited by refraction, but by reflection.

M. *Mariotte* obſerves, that there are two different gradations or ſeries of *Colours* from *white* to *black*; the one *white*, *yellow*, *red* and *black*, and the other *white*, *blue*, *violet*, and *black*.

COLOURS *in particular.*

CERUSS, grind it with glair of eggs, and it will make a very good white. It is too *yellow* for ſome purpoſes, coarſe and gritty.

WHITE-LEAD, grind it with a weak water of gum lake, and let it ſtand three or four days, and if it be afterwards mixt with *roſet* and *vermilion*, it will make a fine carnation.

To order *white-lead* ſo, that it ſhall neither ruſt nor ſhine, both which are of an ill effect in the art of limning. See the article LEAD.

Spaniſh White, being ground with gum water, is the beſt *White* of all to garniſh with.

Lamp-Black, makes a good *Black* being ground with gum water.

Vermilion. If it be ground with the glair of an egg, and a little clarified honey, to make it bright and perfect is good; but native *cinnabar* is better and of a more lively *Colour*.

Cinnabar Lake makes a deep and beautiful red, or rather purple, almoſt like to a red roſe, grind it with *gum lake* and *turnſole water*; if you will have it light, add a little *ceruſs*, and it will make it a bright *crimſon*; if it be to *diaper*, add only *turnſole water.*

Red-lead, grind it with ſome *ſaffron* and a ſtiff *gum-lake*; the *ſaffron* will make it orient and of a marygold *Colour*.

Turnſole, lay it in a ſaucer of vinegar, and ſet it over a chafing diſh of coals; when it boils, take it off, and wring it into a ſhell, adding a little *gum arabick*, let it ſtand till it is diſſolv'd; this is good for ſhadowing carnation and all *yellows*.

Roſet, grind it with *braſile water*, and it will make a deep purple; put *ceruſs* to it and it will be lighter; grind it with *litmoſe*, and it will make a fair *violet*.

Spaniſh Brown, grind it with *braſile water*, mingle it with *ceruſs*, and it will make a horſe fleſh *Colour*. It is not ſo briſk and lively as *Indian red*.

Bole Armoniack makes but a faint *Colour*, the chief uſe of it is in making ſize for burniſh'd gold.

Green Bice is to be ordered as you do *blue Bice*; when it is moiſt and not thorough dry, you may diaper upon it with the water of deep *green*.

Verdigreaſe, grind it with juice of *rue* and a little weak gum water, and you will have a moſt pure *green*; if you would diaper with it grind it with lye of *rue* (or the decoction thereof) and it will make a hoary *green*.

Diaper upon *Verdegreaſe* green with ſap green; alſo *Verdegreaſe* ground with white *tartar*, and then temper'd with gum water, gives a moſt perfect *green.*

Verditer, grind it with a weak *gum arabick* water, it is the fainteſt *green* that is; but is good to lay upon *black* in any kind of drapery.

Sap Green, lay it in ſharp vinegar all night, put into it a little *alum* to raiſe its *Colour*, and you will have a good green to diaper upon other greens.

It is a ſhining but a fading Colour. You may uſe *green pink* inſtead of it, for that has neither of thoſe faults.

Orpiment, *Arſenicum*, *Auripigmentum*, } grind it with a ſtiff water of *gum lake*, becauſe it is the beſt *Colour* itſelf, it will lie upon no *green*; for all *greens*, *white* and *red-lead*, and *ceruſs* ſtain it.

Wherefore, you muſt deepen your *Colours* ſo, that the *Orpiment* may be higheſt, and ſo it may agree with all *Colours.* *It is of a venomous quality, and ſome of it is coarſe.*

Maſticote, grind it with a ſmall quantity of *ſaffron* in gum water, and never make it lighter than it is, it will endure to lie upon all *Colours* and metals.

Saffron, ſteep it in glair, it may be ground with *vermilion.*

Pink Yellow, if you would have it ſad colour'd, grind it with *ſaffron*, if light with *ceruſs*; mix it with gum water, and ſo uſe it.

Oker de Luce, grind it with pure *braſile* water, and it will make a paſſing hair *Colour*, and is a natural ſhadow for gold. *Roman oker is the moſt glowing oker of all okers.*

Umber is a more ſad brown *Colour*, grind it with gum water or gum lake, and lighten it (if you pleaſe) with a little *ceruſs* and a blade of *ſaffron*; to cleanſe it, burn it in a crucible, then grind it and it will be good, and when you temper it in the ſhell uſe a drop or two of onion water, and it will preſerve it from cracking.

Ultramarine, if you would have it deep, grind it with *litmoſe* water, but if light with fine *ceruſs* and a little gum arabick water.

In grinding *Ultramarine* and other *Colours*, be not too ſwift in your motion, but let it be gentle and ſlow, becauſe the ſwiftneſs of the motion cauſes the ſtones to heat; which will cauſe your *Colour* to ſtarve or loſe ſomewhat of its luſtre, eſpecially, if it be a *Colour* of no great body, as *pink*, *indigo*, &c.

Indigo, grind it with water of *gum arabick*, as you do *ultramarine.*

Blue Bice, grind it with clean water, as fine as can be, and then put it into a ſhell, and waſh it, as follows; put as much water

ter to it, as will fill up the ſhell or veſſel you put it into, and ſtir it well; let it ſtand for an hour, then throw away the filth and dirty water, and put in more clean water, do thus four or five times.

Then put ſome *gum arabick* water to it ſomewhat weak, that the *Bice* may fall to the bottom, pour off the gum water, and put more to it, waſh it again, dry it and mix it with weak gum water (if you would have it riſe of the ſame *Colour)* but with a ſtiff water of *gum lake,* if you would have a moſt *perfect blue*; but grind it with a little *ceruſs*, if you would have it a *light blue*, but add *litmoſe* water, if you would have it a very *deep blue.*

Smalt, grind it with a little fine *roſetta*, and it will make a deep *violet*, and by putting in a quantity of *ceruſs*, it will make a light *violet.*

Litmoſe Blue, grind it with *ceruſs*, with a pretty deal of *litmoſe*, it will make a *deep blue,* and with a pretty deal of *ceruſs*, it will make a *light blue*; grind it with the weak water of *gum arabick.*

Take fine *litmoſe*, cut it in pieces, lay it in weak water of *gum lake* for twenty four hours, and you will have a water of a moſt perfect *azure*; with which water you may diaper and damask upon all other *blues*, to make them appear more fair and beautiful.

Orchal. Grind it with unſlack'd lime and urine, it makes a pure violet; by putting to more or leſs lime, you make the violet light or deep as you pleaſe.

Mummy burnt makes a good black; but if not, and is ill-conditioned, hard, and will not flow from the pencil, you may burn it in a crucible well luted.

Engliſh Oker. It is a yellow colour, and lies even in the ſhell of it ſelf; it is of great uſe, being well ground.

Pink mix'd with Blue Bice. It is a good green, the faireſt pink is beſt, well ground and temper'd with blue bice, allowing one quantity of *pink* to three of *blue-bice.*

If you would deepen it for landſcapes or drapery, mix a little indigo finely ground with it.

Indian Lake. This makes a delicate *purple*; grind it with a little gum water, and when it is fine, before you put it into the ſhell, mix a little powder of white ſugar candy with it, which will preſerve it from cracking; then you may ſpread it thinly with your finger about the ſhell.

Indian red makes a very dark red; becauſe this colour is very coarſe, you may uſe *umber* and a little lake tempered, which is as good.

Ivory Black. Grind it with a little white ſugar candy, and it will preſerve it from crackling out of your ſhells; it makes a black.

Cherry Stone is burnt in a crucible (as is the former) and ſo ground. It is good for drapery, and for a black *ſattin*; temper it with a little white *indian lake* and *indigo.* Heighten it with a little lighter mixture; deepen it with *ivory black.*

Caput Mortuum of Vitriol. Firſt grind it well upon a marble; then waſh it well, as is directed for the waſhing white lead: ſee *white* LEAD or WASHING. Then grind it with a weak gum lake water; it will make a deep red, or almoſt purple colour.

Obſervation on Mineral COLOURS.

1. *Sublimate* diſſolv'd in fair water, and mix'd with a little ſpirit of urine, makes a milk white mixture in a moment; which by an addition of *aqua fortis,* becomes tranſparent again immediately.

2. If you ſublime together two ounces of ſublimate, and one ounce of tin glaſs, you will have a ſublimate not inferior to the beſt *orient pearls* in the world.

3. *Silver* diſſolv'd in *aqua fortis*, and evaporated to dryneſs, and having had water poured two or three times upon it, and evaporated till the calx is dry, leaves it of a ſnow whiteneſs; which rubb'd upon the skin (wetted with ſpittle, water, or the like) produces a blackneſs not to be got off in ſome days.

With this may be dyed *ivory*, *hair*, and *horns* in fair water, of a laſting black.

4. *Coral* diſſolved by oil of vitriol, ſulphur, or ſpirit of vinegar, and precipitated by oil of *tartar*, yields a ſnow whiteneſs.

The ſame of crude lead and quickſilver diſſolv'd in *aqua fortis.* So butter of *antimony* rectified by bare effuſion in a good quantity of fair water will (tho' unctuous) be precipitated into that ſnow white powder, which (being waſh'd from its corroſive ſalts) is call'd *mercurius vitæ.* The like of which may be made without the addition of any *mercury.*

5. *Mercury ſublimate* and *precipitate* yield (with the ſpirit of urine, hartſhorn, or the like) a *white precipitate*; but with the ſolution of pot aſhes, or other *lixiviate* ſalts, an orange tawney.

And if on a filtrated ſolution of vitriol, you put the ſolution of a *fixed-ſalt*, there will ſubſide a copious ſubſtance far from *whiteneſs*, which chymiſts call the ſulphur of vitriol.

6. If two ounces of *copper* be mix'd with one ounce of tin, the reddiſhneſs will vaniſh; and if *arſenick* (calcin'd with nitre) in a juſt proportion, be mix'd with melted *copper*, it will be blanch'd both within and without.

7. Fine powders of *blue bice*, and yellow *orpiment*, ſlightly mixed, produce a good green; and a high yellow ſolution of a good gold in *aqua regia*, mix'd with a due quantity of a deep *blue* ſolution of crude copper in ſtrong ſpirit of urine, produces a tranſparent green; and ſo *blue* and yellow enamel fus'd together in the flame of a lamp, being ſtrongly blow'd on without ceaſing, produces at length a green colour.

8. An *urinous ſalt* put in a large quantity into the diſſolution of blue vitriol in fair water, turns the liquor and corpuſcles (which reſided) into a yellowiſh colour like yellow oker.

9. *Verdegreaſe* ground with *ſal armoniack*, and the like (digeſted for a while in an horſe dunghill) makes a glorious *blue*.

10. The true glaſs of *antimony*, extracted with acid ſpirits, (with or without wine) yields a red tincture.

11. *Balſam of ſulphur* (of a deep red in the glaſs) ſhak'd about, or dropt on paper, gives a yellow ſtain.

12. If brimſtone and ſal armoniack powdered, of each five ounces, be mix'd with ſix ounces of quick lime in powder, and diſtill'd in a retort in ſand by degrees, you will have a volatile ſpirit of ſulphur of excellent redneſs, though none of the ingredients be ſo.

So alſo oil of anniſeeds, mix'd with oil of vitriol, gives in a trice a blood red colour, which ſoon decays.

13. Fine ſilver diſſolv'd in *aqua fortis*, and precipitated with ſpirit of ſalt, upon the firſt decanting the liquor, the remaining matter will be purely white; but lying uncovered, that which is expos'd to the ambient air will loſe its whiteneſs.

14. Sublimate diſſolv'd in a quantity of water and filtred, till it is as clear as cryſtal, mixed (in a *Venice* glaſs) with good oil of *tartar per deliquium* filtred (three or four drops to a ſpoonful) will yield an opacous liquor or a deep orange colour; after which, if four or five drops of vitriol be dropt in, and the glaſs ſtraitway be ſtrongly ſhaken, the whole liquor will (to admiration) be colourleſs without *ſediment*.

And if the filtred ſolution of *ſublimed ſal armoniac* and ſublimate, of each alike, be mixt with the ſolution of an *alkali*, it will be *white*.

15. Spirit of ſal armoniack makes the ſolution of *verdegreaſe* an excellent *azure*; but it makes the ſolution of ſublimate yield a white precipitate.

16. So the ſolution of filings of copper in ſpirit of urine (made by fermentation) produces a lovely azure colour, which with oil of vitriol (a few drops to a ſpoonful) is in a trice depriv'd of the ſame, and render'd like fair water.

And ſo alſo a ſolution of *verdegreaſe* in fair water, mixed with ſtrong ſpirit of ſalt or dephlegmated *Aqua fortis*, makes the greenneſs almoſt totally diſappear.

17. *Quickſilver* mixt with three or four times its weight of good *oil of vitriol*, and the oil drawn off in ſand, through a glaſs retort, leaves a ſnow white precipitate, which by the affuſion of fair water, becomes one of the lovelieſt light *yellows* in the world, and a durable colour.

18. *Tin* calcin'd *per ſe* by fire, affords a very white *calx*, call'd *putty*; *lead*, a red powder call'd *minium*; *copper*, a dark or greyiſh powder; *iron*, a dirty yellowiſh colour, call'd *crocus martis*; and *mercury*, a red powder.

19. *Gold* diſſolv'd in *aqua regia*, ennobles the *menſtruum* with its own colour; *ſilver coin* diſſolv'd in *aqua fortis*, yields a tincture like that of *copper*; but fine ſilver, a kind of *bluiſhneſs*. *Copper* diſſolv'd in ſpirit of ſugar (drawn off in a glaſs retort) or in oil or ſpirit of *turpentine*, affords a *green* tincture; but in *aqua fortis*, a *blue*.

20. *Vermilion* is made of *mercury* and *brimſtone* ſublimated together in a due proportion.

21. You may give glaſs a noble golden colour with quickſilver; but it is now coloured yellow, generally with calx of *ſilver*; yet ſhell ſilver (ſuch as is generally us'd with pen or pencil) mixed with a convenient proportion of powdered glaſs in three or four hours fuſion, gives a lovely *ſappharine blue*.

22. Glaſs is ting'd green (by the glaſs men) with the *calx* of *Venus*; which calx, mixt with a hundred times its weight of fair glaſs, gives in fuſion a *blue* coloured maſs.

23. *Putty* (which is tin calcin'd) as it is white of it ſelf, ſo it turns the purer ſort of glaſs metal into a white maſs, which when opacous enough ſerves for a white *enamel*.

24. The white *enamel* is as it were the baſis of all thoſe fine concretes, which goldſmiths and ſeveral artificers uſe in the curious art of enamelling.

For this white and fuſible ſubſtance will receive into it ſelf, without ſpoiling them, the colours of divers other mineral ſubſtances, which like it will endure the fire.

25. Glaſs is ting'd blue with the dark mineral call'd *zaffer* or *zaffora*; and with *manganeſe* or *magneſſa*, in a certain proportion, glaſs may be ting'd of a *red* colour, and alſo of a *purpliſh* or *murrey*; and with a greater quantity, into that deep colour which paſſes for *black*.

26. Yellow *orpiment*, ſublim'd with ſea ſalt, yields a white and cryſtalline *arſenick*; *arſenick* calcin'd with pure nitre, being duly added to *Venus* in the fuſion, gives it a whiteneſs both within and without.

27. So *lapis calaminaris* turns *Venus* or *copper* into *braſs*.

28. And *zink* duly mix'd with *Venus*, when it is in fuſion, gives it the nobleſt golden colour, that was ever ſeen in the beſt gold; but it will not endure various meltings.

29. *Copper* diſſolv'd in *aqua fortis* will imbue ſeveral bodies of the colour of the ſolution.

30. *Gold* diſſolv'd in *aqua regia*, will (tho' not commonly known) dye horn, ivory, and other bones of a durable purple colour.

31. Laſtly, cryſtals of ſilver, made with *aqua fortis*, (tho' they appear white) will preſently dye the skin, nails, hair, and bones, with a *black* not to be waſhed off.

Obſervations on vegetable COLOURS.

1. A ſtrong infuſion of galls filtred, mixt with a ſtrong and clear ſolution of *vitriol*, makes a mixture as black as *ink*; which, with a little ſtrong oil of *vitriol*, becomes tranſparent again. After which, by the affuſion of a little quantity of a ſtrong ſolution of *ſalt of tartar*, it regains its black colour.

The firſt black (altho' pale in writing, yet) being dry, appears to be good ink.

2. A decoction of *red roſes*, dried in fair water, mixed with a filtrated ſolution of *blue vitriol*, makes a black colour; and this being mix'd with a little *aqua fortis*, turns it from a black to a deep red; which, by the affuſion of a little ſpirit of urine, may be preſently reduced to a thick and black colour.

3. *Yellow wax* is whitened by diſſolving it over the fire in ſpirit of wine; letting it boil a little, and then exhaling the ſpirit, or elſe while it is hot, ſeparating it by filtration.

4. Fair water, mixt with a blood red tincture of *benjamin*, drawn with ſpirit of wine, immediately makes it of a milk white colour.

5. Blackneſs may be taken away with oil of vitriol; ſo black pieces of ſilk or hair may be turn'd to a kind of yellow.

6. A handful of *lignum nephriticum* raſp'd, infus'd in four pound of ſpring water, yields between the light and the eye an almoſt golden colour (except the infuſion be too ſtrong;) but with the eye, between the light and it (in a clear vial) a lovely blue, as indeed it is. This with ſpirit of vinegar may be made to vaniſh (ſtill keeping its golden colour;) and afterwards, with oil of tartar *per deliquium*, may be reſtored again.

7. Cloth dyed with *blue* and *woad* is dyed into a green by the yellow decoction of *luteola*.

8. Syrup of violets, mixt with a high ſolution of gold in *aqua regia*, produces a reddiſh mixture; and with a high ſolution of filings of copper in ſpirit of urine, a lovely fair green.

9. *Syrup of violets*, mixt with a little juice of lemons, ſpirit of ſalt, vinegar, or the like acid ſalt, will immediately become red; but mix'd with oil of *tartar*, or a ſolution of pot aſhes, will in a moment become a perfect *green*; and the like in the juice of *blue-bottles.*

10. A good quantity of oil of *tartar*, put into a ſtrong ſolution of *verdegreaſe*, gives a delightful *blue*, which may be variouſly chang'd, by adding ſpirit of urine or hartſhorn.

11. Altho' red roſes hung over the fume of ſulphur, loſe all their redneſs, and become white; yet oil of ſulphur (which is nothing but the fumes condenſed) doth wonderfully heighten the tincture of the ſame.

12. *Cochineal* will have its colour far more heightened by ſpirit of *urine*, than by rectified ſpirit of wine; and one grain of *cochineal* in a good ſpirit of urine, being put into a hundred and twenty ſix ounces of water, ting'd it (although but faintly) which amounts to above 125000 times its own weight.

13. Twenty grains of *cochineal* being mix'd with an ounce of *ſaccharum ſaturni*, will make a moſt glorious purple colour; and ſo accordingly, as the quantity is either diminiſhed or increas'd, ſo the purple colour ſhall be either lighter or deeper.

14. A few grains of *cochineal* being mixt with the *lixivium* of *quicklime* in a due proportion, makes a fading purple colour of the greateſt glory imaginable in the world.

15. The juice of *privet berries* with ſpirit of ſalt is turned into a lovely red; but with a ſtrong ſolution of pot aſhes into a delightful green.

16. *Spirit of ſalt* makes no conſiderable change; but rather a lighter *red* upon things red by nature, as ſyrup of *clove gilliflowers*, juice of *buck-thorn* berries, infuſion of *red-roſes*, *braſile*, &c.

17. Juice of *jaſmin* and ſnow drops, will turn into a deep greeniſh yellow, by a ſtrong alcaline ſolution (altho' the juice of *jaſmin*, &c. before were of no colour.)

18. *Buckthorn berries*, being gathered green and dryed, are call'd *ſap-berries*, which being infus'd in alum water, produces a fair *yellow (which is us'd by book-binders for the edges of books, and to colour leather alſo*;) being gathered when they are black, they are call'd ſap-green, and make a green colour, being put into a braſs or copper veſſel for three or four days; or a little heated upon the fire, and mix'd with alum in powder, and preſſed out; ſo put into bladders, hanging it up till it is dry; and being gathered about the end of *November*, (when they are ready to drop) they yield a purpliſh colour.

19. Tincture of *cochineal*, diluted never ſo much with fair water, will never yield a yellow colour. A ſingle drop of a

deep ſolution in ſpirit of urine, diluted in an ounce of fair water, makes a fair pink, or carnation.

20. Oil or ſpirit of *turpentine*, digeſted with pure white ſugar of lead, yields in a ſhort time a high red tincture, which chymiſts call *balſamum ſaturni*.

21. *Spirit of ſalt* dropt into a ſtrong infuſion of *cochineal* or juice of black-cherries, makes preſently a fair red; but dropt into the infuſion of *braſile*, a kind of yellow. So the filtrated tincture of *balauſtin*, mixt with good ſpirits of urine, or the like, turns of a darkiſh *green*; but with ſpirit of ſalt, a high redneſs, like rich claret wine; which glorious colour may in a moment be deſtroyed, and turned into a dirty green, by ſpirit of urine.

22. A high infuſion of *lignum nephriticum*, mix'd with ſpirit of urine, produces ſo deep a blue, as to render the liquor *opake*; which however vaniſhes, after a day or two, and leaves the liquor of a bright amber colour.

Where you may take notice, that inſtead of ſpirit of urine, you may uſe oil of *tartar*, or a ſtrong ſolution of pot-aſhes.

23. Infuſion of *log wood*, in fair water (mixt with ſpirit of *ſal armoniack*) immediately turns into a deep, rich, lovely purple; two or three drops is enough for a ſpoonful, leſt the colour be ſo deep as to be opake.

24. Spirit of *ſal armoniack* will turn ſyrup of violets to a lovely *green*.

25. An infuſion of *litmoſe* in fair water will in a clear glaſs give a purple colour; but will be wholly chang'd into a glorious *yellow*, by ſpirit of ſalt being added.

26. The infuſions and juices of ſeveral plants will be much altered by a ſolution of lead in ſpirit of vinegar; it will turn the infuſion of red roſe leaves into a ſad *green*.

27. So the tincture of red roſes in fair water would be turn'd into a thick green, with the ſolution of minium in ſpirit of vinegar; and then with the addition of oil of vitriol the reſolved lead would precipitate white, leaving the liquor of a clear high red colour.

28. It has not been yet found, that to exhibit the ſtrong variety of colours, there is need that any more than theſe five be applied, *viz. white*, *black*, *red*, *blue*, *yellow*; for theſe being variouſly compounded, exhibit a variety and number of colours; ſo many, that thoſe who are ſtrangers to painting, can hardly imagine.

29. So *black* and *white* variouſly mixt, make a vaſt company of light and deep *grays*; *blue* and *yellow*, a great variety of *greens*; *red* and *yellow*, ſeveral *orange tawneys*; *red* and *white*, a number

a number of *carnations*; *red* and *blue*, ſeveral *purples*; and thus are many colours produc'd, for which we want names.

30. Acid ſalts deſtroy a blue colour; ſulphureous, urinous, or fixed, reſtore it.

31. *Acid* and *alkalizate ſalts*, with many bodies that abound with ſulphureous or oily parts, will produce a red, as is manifeſt in the tincture of ſulphur, made with lixiviums of calcined tartar or pot aſhes.

Of Preparing COLOURS.

Colours, according to their nature, have each a particular way of preparation, *viz.* by *grinding*, waſhing, or ſteeping.

The chief colours to be ground are theſe; *white lead*, *ceruſs*, *cinnabar*, *lake*, *oker yellow* and *brown*, *pink*, *indigo*, *umber*, *colens earth*, *Spaniſh brown*, *ivory black*, *cherry ſtone black*, *lampblack*, *Indian red*, *Indian lake.*

The chief colours to be *waſh'd* are; *red lead*, *maſticote*, *green bice*, *cedar* green, *ultramarine*, *blue bice*, ſmalt, verditer.

The chief colours to be ſteep'd are; *ſap-green*, *ſaffron*, *turnſole*, *ſtone-blue*, *Venice berries.*

The method of GRINDING COLOURS.

Take the colour you would grind, and ſcrape off from it all the filth; then lay it upon the ſtone, and with the muller, bruiſe it a little; then put to it a little ſpring water, and grind all together very well, till the colour is very fine; which done, pour it out in certain hollows or furrows cut in chalk-ſtone, and there let it lie till it is dry, which preſerve in paper or glaſſes.

Take care in grinding your colours not to put too much water to them upon the ſtone, for they ought to be ground pretty thick like pulp or pap; and they ought not to be left too moiſt, but thick and clammy.

If after your colour is dry in the ſhell, you can rub it off with your fingers, it muſt be better bound with gum; and if there be too much gum, it will ſhine, and be apt to crackle off after it is us'd.

Of mixt and compound COLOURS.

An aſh colour or gray is made by mixing *white* and *lampblack*, or white with *ſinaper*; *indigo* and black make an aſh-colour.

To make an azure or blue. Mix the azure with glue water, and not with gum water.

A bay colour. Mingle *vermilion* with a little *Spaniſh brown* and black.

A bright crimſon. Mix tincture of *brazile* with a little *ceruſs* ground with fair water.

To make a crimſon lake. It is uſually made of the flocks ſhorn off from crimſon cloth, by a lye made of ſalt-petre, which extracts the colour; which precipitate, edulcorate, and dry in the ſun, or in a ſtove.

To make a ſad crimſon. Mix the aforeſaid light crimſon with a little *indigo*, ground w'th fair water.

To make a flame colour. It is made of vermilion and orpiment, mixed deep or light at pleaſure: or thus; take red *lead*, and mix it with *maſticote*, which heighten with white.

To make a glaſs grey. Mingle *ceruſs* with a little *azure.*

To make excellent good greens. The liver of a lamprey makes an excellent green; and yellow lay'd upon blue will change into green; ſo likewiſe the juice of a *blue flower de luce*, mix'd with gum water, will be a perfect and durable green or blue, according as it is us'd.

To make a light green. It is made of *pink* or *ſmalt* with white, to make it whiter, if need require.

To make a lead colour. It is made of *white*, mix'd with *indigo.*

To make a fleſh colour. Mix a little *lake* and red lead with white, a very ſmall quantity of each; you may make it as light or as red as you pleaſe, by putting more or leſs white in it. If you would have a ſwarthy complexion to diſtinguiſh a man's fleſh from a woman's, put a little *yellow oker* among your fleſh colour; and for your ſhadow, put a little more *lake*, and a ſmall quantity of *burnt umber.*

To make a murrey which is compos'd of *purple* and *white*; it is made thus, take cinnabar lake two ounces, white lead one ounce, and grind them together.

To make a good murrey. Temper *roſet* with a little roſe water, in which a little gum hath been diſſolv'd, and it will be good, but not better than the firſt.

To make a pure lake. Take urine ten pounds; boil it in a kettle, and skim it with an iron skimmer, till it comes to eight pounds; to which add *gum lake* half a pound, allum two ounces and a half; boil all till it is well coloured, which you may try by dipping a piece of linen cloth in it; then add ſweet alum in powder a ſufficient quantity; ſtrain it, and let it ſtand; ſtrain it again through a dry cloth, till the liquor be clear; that which remains in the cloth or bag is the pure *lake.*

To make a deep purple. This is made of *indigo*, *Spaniſh brown*, and *white.*

Another purple. Boil log-wood in vinegar and beer in a glaz'd earthen veſſel, adding thereto a little *alum*, till you taſte it to be ſtrong on your tongue; when it is ſufficiently boil'd, ſtrain out the liquor through a cloth, and keep it in a glaſs cloſe ſtopt for uſe.

To make a yellow green on purple. *Buck-thorn berries* gathered green, and ſteep'd in alum water, yield a good yellow; but being thorough ripe and black, they yield a good green; and laſtly, being gathered when they are ready to drop off, which is about the middle or end of *November*, their juice mixt with alum water, yields a good purple colour.

To make a pear green. Take white *tartar* and *verdegreaſe*; temper them with ſtrong white wine vinegar, in which a little gum arabick has been diſſolved.

Another purple Colour. Mix *blue bice* and *lake* together, or if you want *bice*, take *blue* verditer (but that is not altogether ſo good) mix them well together, and it is done. If you want *lake*, you may inſtead thereof uſe thick red ink, which will do as well as lake in waſhing.

To make cloud Colours. You may ſometimes take *blue verditer*, ſometimes light *maſticote* ſhadowed with *blue verditer*, or *lake* and *white*, or *red ink* and *white* ſhadowed with *blue verditer*.

To make a Red Colour. Take the roots of the leſſer *bugloſs*, *viz.* *alkanet*, and beat them, and ſtrain out the juice, and mix it with *alum* water.

To make a Scarlet Colour. It is made of *red-lead*, *lake* and *vermilion*, yet *vermilion* in this caſe is not very uſeful.

To make a pure Purple Colour. Take fine brimſtone an ounce and a half, *quickſilver*, *ſal armoniac*, *jupiter*, of each one ounce, pulverize the ſalt and brimſtone, and make an amalgama with the quickſilver and tin; mix all together, which put into a great glaſs gourd; make under it an ordinary fire, and keep it in a conſtant heat for the ſpace of ſix hours.

A Saffron Colour, is made of *Saffron* alone by infuſion.

To make Vermilion. Take brimſtone in powder four ounces, mix it with quickſilver a pound, put it into a crucible well luted, and upon a charcoal fire heat it till it is red hot, then take it off and let it cool.

To make a Violet Colour. Take a little indigo and tincture of *braſile*, grind them with a little *ceruſs*.

To make a Yellow. Take the *Yellow* chives in white lilies, ſteep them in gum water and they will make a perfect *Yellow*; the ſame from *ſaffron* and tartar tempered with gum water.

TEMPERING *of* COLOURS. Take a little of any *Colour*, and put it into a clean ſhell, and add to it a few drops of gum water, and with your finger work it about the ſhell, and let it dry, and when dry, touch it with your finger; if any *Colour* comes off, you muſt add ſtronger gum water; but being dry, if the *Colour* gliſter or ſhine, it is a ſign there is too much gum in it, which you may remedy, by putting in fair water.

To HELP *the defects of* COLOURS. Some *Colours*, as *lake*, *umber* and others which are hard, will crack; when they are dry in this caſe in tempering them, add a little white ſugar candy in very fine powder; which mix with the *Colour* and fair water in the ſhell, till the ſugar candy is diſſolv'd.

Theſe *Colours*, *umber*, *Spaniſh brown*, *Colen-earth*, *cherry-ſtone* and *ivory-black*, are to be burnt before they are ground or waſh'd.

To BURN *or* CALCINE COLOURS. This is to be done in a crucible, covering the mouth of it with clay, and ſetting it in a hot fire, till you are ſure it is red hot through; which done, being cold, waſh or grind them as before directed.

To prepare SHADOWS *for* COLOURS. *White* is ſhaded with *black*, and contrary-wiſe, *yellow* with *umber* and the *okers*, *vermilion* with *lake*, *blue bice* with *indigo*, *black-coal* with *roſet*, &c.

The ſeveral TEMPERATURES *for colouring and* SHADOWING HISTORY.

They are twenty in number, *viz.*

1. *Sea-coal* mixt with *lake.*
2. *Umber* with *maſticote.*
3. *Yellow-oker* burnt with *white.*
4. *Umber* with *ultramarine.*
5. *Yellow* with *umber.*
6. *Umber* with *lake.*
7. *Verditer* burnt with *red-lead* and *white.*
8. *Ultramarine* with *lake.*
9. *Ultramarine* with *red-lead.*
10. *Ultramarine* with *white.*
11. *Indigo* with *white.*
12. *Indigo* and *lake* with *white.*
13. *Indigo* and *pink* with *white.*
14. *Indigo* with *oker* and *white.*
15. *Indigo* with *maſticote* and *white.*
16. *Cherry-ſtone* burnt with *white* and *red-lead.*
17. *Burnt-Ivory* with *lake.*
18. *Indigo* and *pink* with the beſt *ruſt of iron.*
19. *Lake* and *ruſt of iron* with light *pink.*
20. *Ruſt of iron* and *lake* for the deeper *Shadows.*

The ſeveral TEMPERATURES *or mixtures for* SHADOWING HEADS *after the life.*

The principal mixtures are twelve in number.

1. *Lake* with *Indian-red.*
2. *Red-lead* with *Roman oker.*

3. *Indian-red* with *ultramarine.*
4. *Indian-red* with *pink* and *gall-ſtone.*
5. *Yellow-oker* with *indigo.*
6. *Red-lead* with *pink* and *indigo.*
7. *Red-lead* with *Roman-oker* and *indigo.*
8. *Red-lead* with *pink*, *yellow-oker* and *lake.*
9. *Indigo*, *lake* and *Roman-oker* with *white.*
10. *Indigo*, *pink* and *Roman-oker* with *Indian-red.*
11. *Red-lead* with *umber*, *maſticote* and *pink.*
12. *Pink* with *Roman-oker.*

To WASH COLOURS. Put the *Colour* into a glaz'd veſſel, and put fair water to it plentifully, waſh it well, and decant (after a while) the water; do this ſix or ſeven times; at laſt put the water (being juſt troubled) into another glaz'd veſſel, leaving the dregs at the bottom; then into this ſecond veſſel put more fair water, waſhing it as before, till the water (being ſettled) be clear and the *Colour* remain fine at the bottom.

Before you take the Colour *out of the veſſel, ſpread it very thin, about the ſides thereof, and when it is dry, ſome of it will fall to the bottom, which keep by itſelf; but the remainder which ſticks to the ſides of the baſon is the beſt of all, which with a feather, ſtrike off from the ſides of the veſſel, for it will be finer than any flour.*

STEEPING *of* COLOURS. Take a quantity of the *Colour*, and put it into a ſhell, and fill the ſhell with fair water, to which add ſome fine powder of *allum*, to raiſe the *Colour*; let it thus ſteep a day and night, and you will have a good *Colour.*

Where note, ſaffron ſteep'd in vinegar gives a good *Colour*, and the *Venice* berries in fair water and a little *allum*, or a drop or two of oil of *vitriol* makes a fair *yellow.*

But ſome *Colours* are to be boil'd, as *braſile*, *logwood*, *turnſole*, *rinds of wallnuts*, *wood ſoot*, &c. theſe when boil'd are to be kept cloſe ſtopp'd in glaſſes, till you have occaſion to uſe them.

COLOURS *us'd in* DYING. There are in the art of *Dying* five *Colours* call'd *Simple primary* or *mother Colours*, from the mixture of which all the other *Colours* are form'd; theſe are *blue*, *red*, *yellow*, *brown* and *black.*

Of theſe *Colours*, variouſly mix'd and combin'd, they form the following *Colours*, *panſy*, *blue* and *red*; from the mixture of *blue* and *ſcarlet* are form'd *amaranth*, *violet* and *panſy*; from the ſame mixture of *blue* and *crimſon red* are form'd the *columbine* or *dove Colour*, *purple*, *crimſon*, *amaranth*, *panſy* and *crimſon violet.*

Here it is to be obſerv'd, that they give the name of *crimſon* to all *Colours* made with *cochineal.*

Of *blue* and *red madder* is dyed *purple*, *pepper Colour*, *tan Colour* and *dry-roſe Colour*.

The ſame *blue* with *red* half in grain makes *amaranth*, *tan Colour*, and *dry-roſe Colour*.

Blue and *half red crimſon* compoſe *amaranth*, *tan Colour*, *dry roſe*, a *brown panſy* and *ſur-brown*.

Blue and *yellow* mixt together compoſe a *yellow-green*, *ſpring-green*, *graſs-green*, *laurel-green*, *brown-green*, *dark-green*; as well as *ſea-green*, *parrot-green*, *cabbage-green*, &c. theſe three laſt *Colours* are to be leſs boil'd than the reſt.

This is to be noted, that as to *green* there is no ingredient or drug in nature that will dye it; but the ſtuffs are dyed twice, firſt in *blue* then in *yellow*.

Blue and *brown*. Theſe two *Colours* are never mix'd alone, but with the addition of *red*, either of *madder* or *cochineal*, they form ſeveral *Colours*.

Red and *Yellow*. All the ſhades compos'd of theſe two *Colours*, as *gold-yellow*, *aurora*, *marygold*, *orange*, *nacarat*, *granat-flower*, *flame-colour*, &c. are made with *yellow* and *red* of *madder*; *ſcarlet* being leſs proper as well as too dear.

Red and *Brown*. Of theſe two *Colours* are form'd *cinnamon* colour, *cheſnut*, *musk*, *bear's hair*, and even *purple* if the *red* be that of *madder*.

Yellow and *Brown*. The *Colours* form'd from theſe two are all the ſhades of *feuille mort* and *hair Colours*.

But this may be taken notice of, that though it be ſaid, that there are no *Colours* or ſhades made from ſuch and ſuch mixtures, it is not meant, that none can be made, but that they are more eaſily form'd from a mixture of other *Colours*.

COLOURING, *and* } *Drugs*. Thus dyers diſtinguiſh their
Non COLOURING } drugs; the firſt are applicative, and communicate their colours to the matters boil'd in them, or paſs'd through them. *As woods*, *ſcarlet grain*, *cochineal*, *indigo*, *madder*, *turmeric*, &c. the ſecond ſerve to prepare and diſpoſe the ſtuffs and other matters, and to extract the colour out of the *Colouring* ingredients; as *allum*, *ſalt* or *cryſtal* of *tartar*, *arſenic*, *realgal*, *ſalt-petre*, *common-ſalt*, *ſal armoniac*, *ſal gemmæ*, *agaric*, *ſpirit of wine*, *bran*, *peas flour*, *wheat*, *ſtarch*, *lime* and *aſhes*.

COLOURING *in Painting*. The manner of applying and conducting the *colours* of a picture, or it is the picture of lights and ſhadows form'd by the various *colours*, employ'd in *Painting*.

The *Colouring* is one of the principal branches in *Painting*. M. *Felibien* divides the painter's art into three parts, the *deſign*, the compoſition and the *Colouring*.

The *Colouring* ſtrikes the moſt, but among maſters it always gives place to the deſign.

M. *de Piles* obſerves, that the word *Colouring* in its confin'd ſenſe, is chiefly applicable to a hiſtory piece, ſcarce at all to a landſcape. He adds, that the term *Colouring* relates more immediately to the carnations, than any thing elſe.

The *Colouring* in its general ſenſe, takes in what relates to the nature and union of colours; their agreement or antipathy; how to uſe them to advantage in light and ſhadow, ſo as to ſhew a relievo in the figures, and a ſinking of the ground. What relates to the aerial perſpective, *i. e.* the diminution of colours, by means of the interpoſition of air; the various actions and circumſtances of the luminary and the medium; the different lights both of the bodies illuminating, and illuminated; their reflections, ſhadows, different views, either with reſpect to the poſition of the eye or the object. What produces the ſtrength, fierceneſs, ſweetneſs, *&c.* in *Paintings* well *colour'd* is the various manners of *Colouring* both in figures, landſcapes, *&c.*

The doctrine of COLOURING *is compriz'd under the following Rules.*

Colours are conſidered either in reſpect of their uſe or their *œconomy* and *diſpoſition.*

1. *In reſpect to their uſe.* They are us'd either in oil or water, thoſe in oil again, are either conſidered with a view, either to their preparation or application.

In the preparation of oil colours, care muſt be taken that they be ground fine; that in putting them on the pallet, thoſe which will not dry of themſelves be mix'd with drying oil or other ingredients of a drying quality, and that the ting'd colours be mix'd in as ſmall quantities as poſſible.

For their *application*, it is conſider'd either in reſpect to the kinds of painting in works of various colours, or in thoſe of one ſingle colour.

For the firſt in the larger pieces, the colours are either laid on full, ſo as they may be impaſted, or incorporated together, which makes them hold the more firmly.

Or elſe, the more agreeable ones are mixt, which dry too hard and too haſtily, with a little *colour*, and the cleareſt of the oil; but in both caſes the colours are to be laid on ſtrong at firſt, it being eaſy to weaken thoſe that are to be thruſt back, and to heighten the others; the touches to be bold by the conduct of a free and ſteady pencil, that the work may appear the moſt finiſh'd at a proper diſtance, and the figures animated with life and ſpirit.

As to *glaz'd colours*, care is to be taken that the under colour be painted ſtrong, and that it be a body colour and laid ſmooth.

In finiſh'd works which are to be view'd near at hand, they proceed, either by applying each *colour* in its place, preſerving their purity without fretting or tormenting them, but ſweetly ſoftening all their extremities; or by filling up all the great parts with one ſingle *colour*, and laying the other colours which are to form the little things upon it, which is the more expeditious way, but the more apt to decay.

For the ſecond, the kinds of pictures in one *colour* are two, *viz. camieux*, where the degradations of colours of objects afar off, are uſually manag'd by lights, as with crayons and *baſſo relievo*; which is an imitation of ſculpture of whatſoever matter and colour, in both theſe the colours are wrought dry. See CAMIEUX.

As for *water colours*, they are wrought various ways, *viz.* in *diſtemper*, where the colours are prepared in ſize, which method is us'd on all kinds of matter, in *freſco* or painting on freſh mortar; where the *Colouring* muſt be quick, that the matter dry not, and with much care and neatneſs, laying each colour in its place, and intermingling them by parcels.

In *agouache*, where the colours are mixt with gum, and the pencil dragg'd as in paintings and waſhings.

In *miniature*, for ſmall and delicate works, where the colours are to be very fine and clean, mixt with gums and wrought in dots or points.

But in all the kinds of painting both in *oil* and *diſtemper*, eſpecially the latter, care muſt be taken that the deſign be fix'd, and all the parts mark'd out, before any colours be apply'd.

But the ſecond part of *Colouring*, or the œconomy and diſpenſing thereof in paintings, regard is had, either firſt to the quality of the *colours*, to appropriate them according to their value and agreement, or ſecondly, to their effect in the union and œconomy of the work.

As to the firſt, it muſt be obſerv'd, that *white* repreſents light, and gives the briskneſs and heightning; on the contrary, *black* like darkneſs obſcures and effaces the objects; again, *black* ſets off the light parts, and by that they ſerve each other to looſen the objects.

A proper choice is to be made of *colours*, and the too much charg'd manner is to be avoided, both in *carnations*, where *red colours* are not to be affected, as rather reſembling the fleſh when flead than the skin; and all bright *glowing colours*, the skin, how delicate ſoever, being of a down-colour.

In the *drapery*, where the painter has his whole ſtock of *colours* to chuſe out of to procure a good effect, and in the landſcape to diſpoſe of thoſe colours near one another, which mutually aſſiſt and raiſe each other's force and briskneſs; as *red* and *green*, *yellow* and *blue*.

To manage them ſo, as that they be accommodated to the effects of the great parts of light and colour, that the ſtrong colours lead to the ſoft ones, and make them more look'd at; bringing them forwards or keeping them back according to the ſituation and degree of force requir'd.

As to the *effects* of *colours*, they either have relation to the union or the œconomy; with reſpect to the firſt, care muſt be taken, that they be laid ſo as to be ſweetly united under the briskneſs of ſome principal one; that they participate of the prevailing light of the piece, and that they partake of each other by the communication of light, and the help of reflection.

As for the œconomy in managing their degrees, regard is to be had to the *contraſt* or oppoſition intervening in the union of the *colours*; that by a ſweet interruption, the briskneſs which otherwiſe fades and palls, may be rais'd to the harmony which makes the variety of *colours* agree; ſupplying and ſuſtaining the weakneſs of ſome, by the ſtrength of others, neglecting ſome places to ſerve as a baſis or repoſe to the ſight, and to enhance thoſe, which are to prevail through the piece.

As to the *degradation*, where the better to proportion the colours that fall behind, ſome of the ſame kind are to be preſerv'd in their purity, as a ſtandard for thoſe carry'd afar off to be compar'd by, in order to juſtify the diminution; regard being always had to the quality of the air, which when loaded with vapours, weaken the colours more than when clear.

As to the *ſituation* of the *colours*, in this, care muſt be taken, that the pureſt and the ſtrongeſt be plac'd before or in the front of the piece, and that the compound ones, which are to appear at a diſtance, be kept back by their force; the glaz'd colours particularly to be us'd in the firſt rank.

Laſtly, as to the *expreſſion* of the ſubject, and the nature of the matters or ſtuffs, whether ſhining or dull, opake or tranſparent, poliſh'd or rough.

COLOURING. Colours, ſays the ingenious Mr. *Richardſon*, are to the eye, what ſounds are to the ear, taſtes to the palate, or any other objects of our ſenſes, are to thoſe ſenſes; and accordingly, an eye that is delicate takes in proportionable pleaſure from beautiful ones, and is as much offended with their contraries.

Good *Colouring* therefore in a picture, is of conſequence, not only as it is a truer repreſentation of nature, where every thing is beautiful in its kind, but as adminiſtring a good degree of pleaſure to the ſenſe.

The Colouring *of a picture muſt be varied according to the ſubject, the time and place.*

If the ſubject be grave, melancholy or terrible, the general teint of the *Colouring* muſt incline to *brown*, *black* or *red* and gloomy; but you muſt be gay and pleaſant in ſubjects of joy and triumph. See EXPRESSION.

Morning, noon, evening, night, ſun-ſhine, wet or cloudy weather, influences the colours of things, and if the ſcene of the picture be a room, open air, partly open and partly inclos'd, the *Colouring* muſt be accordingly.

The diſtance alſo alters the *Colouring*, becauſe of the medium of air, through which every thing is ſeen, which being blue, the more remote any object is, the more it muſt partake of that colour, and of conſequence muſt have leſs force or ſtrength; the ground therefore, or whatſoever is behind a figure (for example) muſt not be ſo ſtrong, as that figure is, nor any of its parts which round off, as thoſe that come nearer to the eye; and that not only for the reaſon already given, but becauſe there will always be reflections ſtronger or weaker, that will diminiſh the force of the ſhadows, which reflections (by the way) muſt partake of the colours of thoſe things from whence they are produc'd.

Any of the ſeveral ſpecies of colours may be as beautiful in their kinds as the others, but one kind is more ſo than another, as having more variety, and conſiſting of colours more pleaſing in their own nature; *in which harmony and agreement of one tinct with another, the goodneſs of* Colouring *conſiſts.*

To ſhew the beauty of variety, I will inſtance in a *gelder-roſe*, which is white, but having many leaves one under another, and lying hollow, ſo as to be ſeen through in ſome places, which occaſions ſeveral tincts of light and ſhadow; and together with theſe ſome of the leaves having a greeniſh tinct, all together produces that variety, which gives a beauty not to be found in this paper, though it is white, nor in the inſide of an egg-ſhell though whiter, nor any other white object, that has not that variety.

And this is the caſe, though this flower be ſeen in a room, in gloomy or wet weather; but let it be expos'd to the open air, when the sky is ſerene, the blue that thoſe leaves, or parts of leaves that lie open to it will receive, together with the reflections that then will alſo happen to ſtrike upon it, will give a great addition to its beauty.

But let the ſun-beams touch up its leaves, where they can reach with their fine yellowiſh tinct, the other retaining their sky blue, together with the ſhadows and brisk reflections it will then receive, and then you will ſee what a perfection of beauty it will have; not only becauſe the colours are more pleaſant in themſelves, but there is greater variety.

A sky entirely blue would have leſs beauty than it has, being always varied towards the horizon, and by the ſun-beams, whether riſing, ſetting, or in its progreſs; but neither has it that beauty, as when more varied with clouds, ting'd with yellow, white, purple, *&c.*

A piece of ſilk or cloth, hung or laid flat, has not the beauty, though the colour of it be pleaſing, as when flung into folds; nay, a piece of ſilk that has little beauty in itſelf, may be much improv'd only by being pink'd, water'd or quilted; the reaſon is, in theſe caſes there ariſes a variety produc'd by lights, ſhades and reflections.

There are certain colours leſs agreeable than others, as a brick wall for example; yet when the ſun ſtrikes upon one part of it, and the sky tinges another part of it, and the ſhadows and reflections the reſt, this variety ſhall give even that a degree of beauty.

Perfect black and white are diſagreeable, for which reaſon, *a painter ſhould break theſe extremes of colours, that there may be a warmth and mellowneſs in his work; let him (in fleſh eſpecially) remember to avoid the chalk, the brick and the charcoal, and think of a pearl and a ripe peach.*

But it is not enough, that the colours in themſelves are beautiful ſingly, and that there is variety, *they muſt be ſet by one another, ſo as to be mutually aſſiſtant to each other*; and this not only in the object painted, but in the ground, and whatſoever comes into the compoſition, ſo as that every part, and the whole together may have a pleaſing effect to the eye, ſuch a harmony to it as a good piece of muſick has to the ear; but for which no certain rules can be given, no more than for that, except in ſome few general caſes, which are very obvious, and need not therefore be mentioned here.

The beſt that can be done, is to adviſe one who would know the beauty of *Colouring, to obſerve nature, and how the beſt colouriſts have imitated her.*

What a lightneſs, thinneſs and tranſparency, what a warmth, cleanneſs and delicacy, is to be ſeen in life and good pictures?

He that would be a good colouriſt himſelf, muſt moreover practiſe much, and for a conſiderable time accuſtom himſelf to ſee well colour'd pictures only; but even this will be in vain, unleſs he has a good eye, in the ſenſe, as one is ſaid to have a good ear for muſick; he muſt not only ſee well, but have a particular delicacy with relation to the beauty of colours, and the infinite variety of tincts.

The *Venetian*, *Lombard* and *Flemiſh* ſchools have excell'd in *Colouring*; the *Florentine* and *Roman* in *deſign*; the *Bologneſe* maſters in both; but not to the degree generally as either of the other.

Correggio, *Titian*, *Paolo Veroneſe*, *Rubens* and *Van Dyck* have been admirable colouriſts; the latter, in his beſt things, has follow'd nature extremely cloſe.

Rafaelle's *Colouring*, eſpecially in his ſhadows, is blackiſh. This was occaſion'd by the uſe of a ſort of printer's black, and which has chang'd its tinct, though it was warm and glowing at firſt, upon which account he was fond of it, though he was advis'd what would be the conſequence.

However, by the vaſt progreſs he made in *Colouring*, after he apply'd himſelf to it, 'tis judg'd he would in this part of painting alſo have excell'd as in the others.

Here would have been a double prodigy! Since no one man has ever poſſeſs'd even *Colouring* and *Deſigning*, to that or any very conſiderable degree.

Though the *Cartoons* are ſome of the laſt of his works, it muſt be confeſs'd the *Colouring* of them is not equal to the drawing; but at the ſame time, neither can it be deny'd, but that he that painted thoſe could colour well, and would have colour'd better.

It muſt be conſidered, they were made for patterns for tapeſtry, not profeſs'd pictures, and painted not in oil, but in diſtemper; if therefore one ſees not the warmth and mellowneſs, and delicacy of *Colouring*, which is to be found in *Correggio*, *Titian* or *Rubens*, it may be in a meaſure fairly imputed to theſe cauſes.

A judicious painter has other conſiderations relating to the *Colouring*, when he makes patterns for tapeſtry to be heighten'd with gold and ſilver, than when he paints a picture, without any ſuch view; nor can a ſort of dryneſs and harſhneſs be avoided in *diſtemper* upon paper.

Beſides, time hath apparently chang'd ſome of the colours.

In a word, the *tout enſemble* of the colours is agreeable and noble, and the parts of it are in general extremely, though not ſuperlatively good.

I will only add one obſervation here concerning the colours of the *draperies* of the Apoſtles, which are always the ſame in all the *Cartoons*; only St. *Peter*, when he is a fiſherman, has not his large apoſtolical drapery on.

This Apoſtle when dreſs'd wears a yellow drapery over his blue coat, St. *John* a red one over a green, ſo does St. *Paul*, which is alſo the ſame which he wears in the famous St. *Cecilia*, which was painted near ten years before.

The various ſorms and degrees of COLOURING.

There are four various forms or degrees of *Colouring*, viz.

1. Of infants or children.
2. Of virgins or fair women.
3. Naked bodies.
4. Old or aged bodies.

1. *Infants* or *young children* are to be painted of a ſoft and delicate complexion, the skin and ears of a ruddy and pleaſant colour, almoſt tranſparent.

This may be done with *white-lead*, *lake*, and a little *red-lead*, ſhadowing it thin, faint and ſoft, letting the *cheeks*, *lips*, *chin*, *fingers*, *knees* and *toes* be more ruddy than the other parts; making all their linen very fine, thin and tranſparent or perſpicuous, with ſtrong touches in the thickeſt folds.

2. *Virgins and fair women* are as curiouſly to be expreſs'd as the former, but their muſcles ought to appear more plainly; their ſhapes more perfect, and their ſhadows to be of a whitiſh yellow, bluiſh, and in ſome places almoſt purple.

But the moſt perfect and exquiſite direction, is the life, which ought rather to be followed, than any thing delivered by rule.

For the ſhadows here, mix white with *pink*, and *indigo* and *white*, and in ſome places *lake* with a little *indigo* and *white*.

As for womens bodies, *viz.* ſuch as are naked, they are to be repreſented ſoft, round, plump, gentle and tender, and without muſcles.

On the contrary the bodies of men are to be repreſented ſtrong, ſturdy, ſtout and vigorous, with the muſcles exactly plac'd and ſtrong; which to do with judgment and underſtanding, requires time, ſtudy and knowledge in anatomy.

3. Naked bodies are to be painted ſtrong, lively and accurate, exactly matching the reſpective pairs of muſcles and nerves, fixing each artery in its due and proper place, giving each limb its proper motion, form and ſituation, with its true and natural colour; all which to do well, may be the ſtudy and practice of almoſt ones whole life.

4. *Old or aged bodies* ought to be eminent for exact and curious ſhadows, which may be made of *pink*, *lake*, and *ivory black*, which make very proper ſhadows in appearance, like the wrinkles and furrows of the face and hands in extreme old age.

Let the eyes be dark, the aſpect melancholy, and hair white (or elſe the pate bald) and all the remarks of antiquity or age be very apparent.

Pink mixt with *lake* and *red-lead* make an excellent ſhadow for the bodies of *old men*; but for the extremeſt or deepeſt ſhadowings, either in face or body, mix *lake* and *ivory black*, which will make an excellent deep ſhadow, and will be very uſeful in expreſſing the ſeveral furrows and wrinkles in the face and hands of very old people, with their dark eyes and melancholy aſpects.

But notwithſtanding all the foregoing rules, the poſture or form of ſtanding, and being, either of the whole body or any of its parts, ought to be diligently obſerv'd, that the life may be imitated.

The making original COLOURS.

To make white Lead. Put into an earthen pot or crucible ſeveral plates of fine *Lead*, cover them with white wine vinegar, covering the top of the pot cloſe with clay; then bury it in a cellar for ſeven or eight weeks, and you will have a good white lead upon the plates, which wipe off.

To make Verdegreaſe. Hang plates of copper over the fumes of *aqua fortis* or ſpirit of nitre, or dip them in the ſame or in vinegar.

To make an Emerald Colour. Powder *verdegreaſe* very fine, temper it with varniſh, and lay it upon a ground of liquid ſilver burniſht, and it will look like a fair *Emerald.*

To make a Ruby Colour. Mix varniſh with *Florence lake*, and it will make a very fair colour.

To make a Sapphire Colour. Mix *verdegreaſe* and *ultramarine* with *varniſh*, and it will make a glorious *Sapphire.*

To make a Crimſon Velvet. Mix *turnſole* with *Indian lake* (well ground with gum and ſugar candy) lay it on full, and when it is wet, wipe away the colour with a dry pencil, where you would have the heightening of the *Crimſon Velvet* appear, and the ſtronger reflection will be well expreſs'd.

To make a Silver black. Take fine *Silver* filings of plates, and diſſolve them in ſpirit of *nitre* or *aqua fortis*, and evaporate to drineſs, or precipitate *cum oleo ſulphuris* or ſalt water, and you will have a ſnow white precipitate, which mixt with water makes the beſt black in the world, for dying all manner of hair, bones, horns, woods, metals, *&c.*

To make a Murrey or Amethyſt. This is made by grinding *Indian lake* with *gum arabick* water only.

To make Red or Ruby for limning. This alſo is made of *Indian lake* (which breaks of a ſcarlet colour) ground with gum water and ſugar candy.

To make azure Blue or Sapphire. You may make this of *ultramarine* of *Venice* (which is the beſt) the beſt *blue ſmalt*, or *blue bice* ground with gum water only; alſo good ſhadowing *blues* may be made of *indigo*, *flory* and *litmoſe*, all which need no waſhing, nor *litmoſe* no grinding, but only to be infus'd in a *lixivium* of ſoap-aſhes.

To make a Green or Emerald. Make it of cedar green inſtead of which take green bice to draw with; pink is good alſo for landſcapes, mix'd with bice aſhes, as alſo with maſticote and ceruſs.

To make a Yellow or Topaz. Take maſticote, of which there are divers ſorts, *viz.* deeper and paler. Alſo *yellow oker* may do for want of better, ſhadow maſticote with *yellow oker*, deepen it with *oker de luce.*

To make ultramarine. Take *lapis lazuli* of the deepeſt colour (having few veins of gold upon it) put it into a crucible, cover it cloſe, heat it red hot, then quench it in urine, vinegar or water, in an earthen pot with a lid; dry it well, then nip off the hard, gray and whiteſt part from it, with a pair of pincers; then grind the remainder with honey'd water, as fine as may be, and dry it for uſe.

The honey'd water is made by boiling two ſpoonfuls of honey in a quart of water.

The uſe and nature of dry COLOURS.

1. Blue *bice* is the moſt excellent blue next to *ultramarine*, which is too good to waſh withal, and therefore I leave it out here, and put in blue *bice*, which will very well ſerve inſtead of it; and indeed, you may leave out both, and uſe ſmalt inſtead of them, but that it will not work as well as *bice*. *Bice* is too good to uſe upon all occaſions, but when you intend to beſtow ſome coſt and pains upon a piece; otherwiſe you may uſe no other blue in your work than blue *verditer*, with which you may make a very good ſhift, without any other blue, I mean in any ordinary work.

2. *Indigo* is a dark blue which is uſed principally to ſhadow with upon your other blue; *indigo* and *yellow berries* mixt together make a dark green to ſhadow other greens in the darkeſt places.

3. Blue *verditer* is a very bright pleaſant blue, and the eaſieſt to work with in water; it is ſomewhat inclining to a green, and being mix'd with yellow berries it makes a good green; this is moſt uſed.

4. *Verdegreaſe* is a good green, but ſubject to decay; when it is dry upon the paper, it will be of a lighter colour than it was when you lay'd it firſt on; therefore, to preſerve it from that fault, put ſome ſap-green amongſt it to diſſolve in it, and it will make it keep its colour. There is diſtill'd *verdegreaſe* to be bought at the colour-ſhops, that is a far better green than the other, but it is ſomewhat dearer, and the other will ſerve inſtead of it.

5. *Verditer-green* is a light green, ſeldom uſed in any thing but in colouring landſcapes, and thoſe places that ſhould ſhew afar off; and it is good for ſuch a purpoſe, becauſe it is ſomewhat inclining to a blue; but you may make ſhift to do any thing well enough without it; for a little blue *verditer*, mixed with *copper green* and a little *white*, make juſt ſuch another green.

6. *Sap Green* is a dark, dirty green, and never uſed but to ſhadow other greens in the darkeſt places, or elſe to lay upon ſome dark ground behind a picture which requires to be coloured with a dark green; but you may make ſhift well enough without this green, for *indigo* and *yellow-berries* make juſt ſuch another colour.

7. *Copper Green* is an excellent tranſparent green, of a ſhining nature, if it be thickened in the ſun, or upon a gentle fire; and it is moſt uſed of any green in waſhing, eſpecially in colouring of the graſs, ground, or trees, for it is a moſt perfect graſs green.

8. *Vermilion* is the perfecteſt ſcarlet colour; you need not grind it nor waſh it; it is fine enough of it ſelf, only temper it with your finger in a gallipot, or oyſter-ſhell, with gum-water, and it will be ready for uſe; if you put a little yellow berries amongſt it, it will make the brighter colour; this is principally uſed for garments.

9. *Lake* is an excellent *crimſon* colour; with it you may ſhadow vermilion, or your yellow garments in the darkeſt places; with it you may make a ſky colour, being mixed only with white; with it you may make a fleſh colour, ſometimes mixed together with white and a little red-lead; it is an excellent colour itſelf, to colour garments or the like.

Indian lake is the beſt lake, but too good to be uſed to waſh prints with, unleſs you intend to beſtow great curioſity upon your works; but the beſt ſort of ordinary lake will ſerve well enough for ordinary uſes, but that alſo will be ſomewhat more coſtly.

Therefore, inſtead thereof, you may uſe red ink thickened upon the fire, and it will ſerve very well for your purpoſe, and better than lake, unleſs it be very good.

Note, if you would make a light ſky colour of your red ink, or if you would mix it amongſt your fleſh colour, you muſt not thicken it; you ſhould rather chuſe to ſhadow your vermilion with *Spaniſh* brown, than thick red ink, which will ſerve well for that purpoſe, but is not altogether ſo bright a colour and clean.

10. *Red-lead* is the neareſt to an orange colour, and putting a little yellow berries into ſome of it, will make a perfect orange colour; but if you mean to make fleſh colour of it, you muſt

put no yellow, but only when you would make an orange colour. This colour is uſed in colouring of buildings, or high-ways in landſcape, being mixed with a little white.

Alſo it is the only bright colour to ſhadow yellow garments with, to make them ſhew like changeable taffety. It is good alſo to colour any light ground in a picture, taking only the thin water of it, and ſo for ſeveral other uſes, as you ſhall ſee occaſion for it.

11. *Yellow berries* are moſt uſed in waſhing of all other colours; they are bright and tranſparent, fit for all uſes, and will be ſufficient, without the uſe of any other yellow.

12. *Saffron* is a deep yellow, if you let it ſtand a pretty while; it is good principally to ſhadow yellow berries with inſtead of red-lead, and it is ſomewhat of a brighter ſhadow; but you may make ſhift well enough without this colour, for red-lead and yellow berries make juſt ſuch another colour.

13. *Maſticote* is a light yellow juſt like yellow berries and white, and therefore you may make ſhift well enough without it, only for ſaving you a labour to mix your yellow berries with white, when you have occaſion for a light yellow, which you may ſometimes make uſe of to colour a light ground in a picture, and then ſhadow it with the water of burnt *umber* or *red-lead*, that is the thinneſt part of the colour.

14. *Ceruſs* is the beſt white, if it be good and finely ground, or for want of it, white lead picked; either of theſe will ſerve well enough, for either of them being mingled with another colour make it lighter, and the more you put, the lighter they will be.

15. *Spaniſh brown* is a dirty brown colour, but of no great uſe to colour any garment with, unleſs it be an old man's gown; to ſhadow *vermilion*, or to lay upon any dark ground behind a picture, or to ſhadow yellow berries in the darkeſt places, when you want lake or thin red ink.

16. It is the beſt and brighteſt colour, when it is burnt in the fire till it be red hot; tho' if you would colour any hare, horſe, dog, or the like, you muſt not burn it; but for other uſes, it is beſt when it is burnt; for inſtance, to colour any wooden poſt, bodies of trees, or any thing elſe of wood, or any dark ground in a picture. It is not to be uſed about any garments, unleſs you would colour many old mens gowns or caps ſtanding together, becauſe they muſt not be all of one colour; therefore, for diſtinction and variety's ſake, you may uſe umber unburnt for ſome of them.

17. *Printer's black* is moſt uſed, becauſe it is eaſieſt to be had, and ſerves very well in waſhing.

Note, You muſt not put any black amongſt your colours to make them dark, for it will make them dirty; neither ſhould you ſhadow any colour with black, unleſs it be *Spaniſh* brown, when you would colour an old man's gown that requires to be done of a ſad colour; for whatſoever is ſhadowed with black, will look black, and not bright, fair and beautiful.

18. *Ivory burnt*, or for want of that, *bone burnt* is the blackeſt black, and is thus made; take ivory, or for want of it, ſome white bone, and put it into the fire till it be thoroughly burned; then take it out, and let it cool; ſlit it, take out the blackeſt of it in the middle, and grind it for your uſe.

COMELINESS is repreſented in painting, &c. by a beautiful nymph of a graceful aſpect in changeable taffety, on her girdle is embroidered a *Cupid* and *Mercury*'s rod, holding the corn marigold in her right hand, and the bird wagtail in her left.

Every fair face is not comely. *Vultu pulchro magis quam venuſto*, Gracefulneſs to beauty is like ſalt to meat, gives it a reliſh; the girdle of *Venus* was of needle-work, and had the virtue to get love; the wagtail, becauſe it was thought to have in it an innate power to excite amorous thoughts, and they ſay a man *lyngem habet*, who is ſo graceful that he charms.

COMMERCE is repreſented in painting, &c. by a man with his fore finger pointing to two mill-ſtones ſtanding by him; a ſtork on his right arm, and a buck at his feet.

The two mill-ſtones denote action and commerce, for being double, the one can do nothing without the other, nor grind any corn alone. The ſtorks help one another in flying, and the bucks in ſwimming.

COMMONWEALTH is repreſented in painting by a lady reſembling *Minerva*, holding an olive branch in one hand, and a ſhield; and in the other a javelin, with a helmet on her head.

Her deportment, like *Minerva*, ſhews that wiſdom is the principle of good government; the helmet, that the republick ought to be well fortified and ſecured from foreign force. The olive and dart, that peace and war are both beneficial to the Commonwealth; war, becauſe by experience valour is attained; peace, becauſe by leiſure prudence to govern is acquired.

COMPASSION. The lively attention to the misfortunes of others, which is call'd compaſſion, cauſes the eye-brows to ſink towards the middle of the forehead; the eye-ball to be fixt upon the object; the ſides of the noſtrils next the noſe to be a little elevated, making wrinkles in the cheeks; the mouth to be open; the upper lip to be lifted up and thruſt forwards; the muſcles and all the parts of the face ſinking down and turning towards the object which cauſes the paſſion. And by theſe expreſſions it is to be repreſented in drawing. See the plate.

COMPASSION is repreſented in painting, *&c.* by a woman holding a pelican's neſt in her left hand, who piercing her breaſt, ſeems to ſuckle her young ones with her blood; ſhe extends her hand in a compaſſionate manner to beſtow charity on the indigent.

The pelican is a true emblem of compaſſion, for ſhe is ſaid never to ſtir from her young, and when her nouriſhment fails, ſhe feeds them with her own blood. Her extended hand denotes her readineſs to relieve with her own ſubſtance.

COMPLAINT to GOD is repreſented in painting, *&c.* by a woman clothed in a white veil, of a ſorrowful countenance, looking up to heaven; laying one hand upon her breaſt, ſhewing the other bitten by ſerpents.

Her cheeks bathed in tears, demonſtrate her complaint; her looks, that ſhe directs her complaint to God; her hands denote the reaſon of her complaint to be ſome offence, ſignified by the ſerpents; her white raiment and hand upon her breaſt denote innocence.

COMPOSITION is putting together for the advantage of the whole, what ſhall be judged proper to be the ſeveral parts of a picture; either as being eſſential to it, or becauſe they are thought neceſſary for the common benefit: And moreover, the determination of the painter, as to certain attitudes and colours, which are otherwiſe indifferent.

The Compoſition of a picture is of vaſt conſequence to the goodneſs of it; 'tis what firſt of all preſents itſelf to the eye, and prejudices us in favour of, or with an averſion to it; 'tis this that directs us to the ideas that are to be conveyed by the painter, and in what order; and the eye is delighted with the harmony at the ſame time as the underſtanding is improved. Whereas this being ill, tho' the ſeveral parts are fine, the picture is troubleſome to look upon, and like a book, in which are many good thoughts, but flung in confuſedly, and without method.

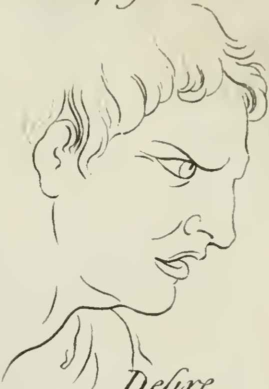
Every picture ſhould be ſo contriv'd, as that at a diſtance, when one cannot diſcern what figures there are, or what they are doing, it ſhould appear to be compoſed of maſſes, light and dark; the latter of which ſerve as repoſes to the eye. The forms of theſe maſſes muſt be agreeable, of whatſoever they conſiſt, ground, trees, draperies, figures, *&c.* and the whole together ſhould be ſweet and delightful, lovely ſhapes and colours, without a name; of which there is an infinite variety.

And 'tis not enough that there be great-maſſes; they muſt be ſubdivided into leſſer parts, or they will appear heavy and diſagreeable.

Plate. III.

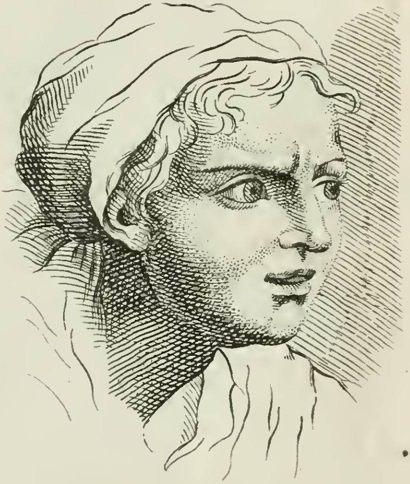
ing.

Compaſsion.

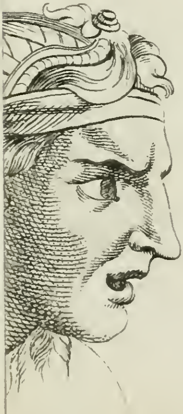


m Deſpair.

Deſire.



ear.



Fear.

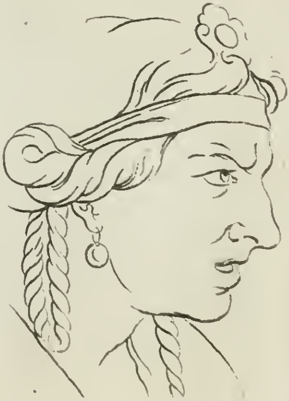
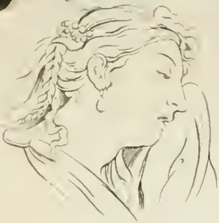
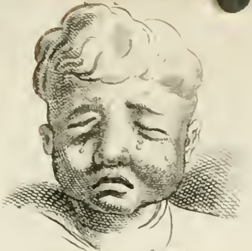


Plate III

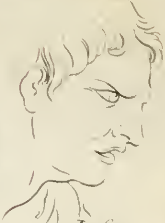
Dejection.



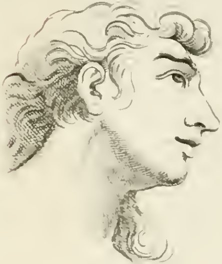
Crying



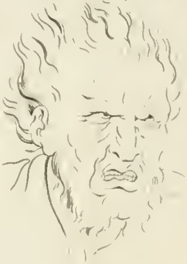
Compaſsion.



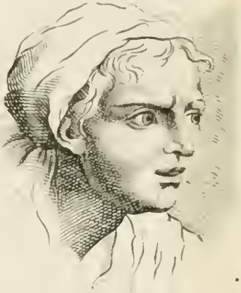
Eſteem.



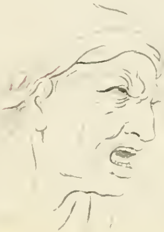
Extream Deſpair



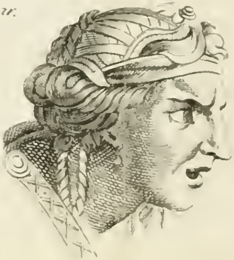
Deſire.



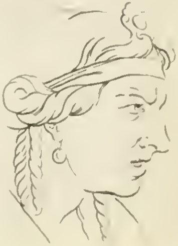
Anger mixt w.th Fear.



Fear



Fear.



agreeable. Thus, tho' there is evidently a broad light (for example) in a piece of ſilk, when covering a whole figure, or a limb, there may be leſſer folds, breakings, flickerings, and reflections, and the great maſs yet evidently preſerv'd.

Sometimes one maſs of light is upon a dark ground, and then the extremities of the light muſt not be too near the edges of the picture, and its greateſt ſtrength muſt be toward the centre; as in the deſcent from the croſs, and the dead Chriſt, both of *Reubens*, and of both which there are prints, one by *Voſterman* and the other by *Pontius*.

Mr. *Richardſon* has a painting of the Holy Family by *Reubens* of this ſtructure; where, becauſe the maſs of light in one part, would elſe have gone off too abruptly, and have made a leſs pleaſing figure, he has ſet the foot of S. *Elizabeth* on a little ſtool: here the light catches, and ſpreads the maſs ſo as to have the deſired effect. Such another artifice *Rafaelle* has uſed in a madonna, of which Mr. *Richardſon* has a copy; he has brought in a kind of an ornament to a chair for no other end (as may be imagined) but to form the maſs agreeably.

Van Dyke, that he might keep his principal light near the middle of his picture, and to advantage the body which he ſeems to have intended to exert himſelf in, has even kept the head ſombrous in an *ecce homo*, which Mr. *Richardſon* has of his, and makes the whole have a fine effect.

The ſame author ſays, he has many times obſerv'd with a great deal of pleaſure the admirable compoſition (beſides the other excellencies) of a fruit-piece of *Michael Angelo Compadoglio*. The principal light is near the centre (not exactly there, for thoſe regularities have an ill-effect,) and the tranſition from thence, and from one thing to another, to the extremities of the picture all round, is very eaſy and delightful; in which he has employed fine artifices by leaves, twigs, little touches of lights ſtriking advantageouſly, and the like. So that there is not a ſtroke in the picture without its meaning; and the whole, tho' very bright, and conſiſting of a great many parts, has a wonderful harmony and repoſe.

Sometimes the ſtructure of a picture, or the *tout-enſemble* of its form, ſhall reſemble dark clouds on a light ground; as in two aſſumptions of the Virgin by *Bolſwert*, after *Rubens*. *Le Brun* in a ceiling of the ſame ſubject, grav'd by young *Simconneau*, has put a group of angels, which almoſt hide the cloudy *voiture* of the Virgin; but this maſs is of too regular and heavy a ſhape.

There are inſtances where two maſſes, a light and a dark one, divide the picture, each poſſeſſing one ſide. Of this ſort is one done by *Rubens*, and as fine a compoſition as can be ſeen;

the maſſes are ſo well rounded, the principal light being near the middle of the bright one, and the other having ſubordinate lights upon it, ſo as to connect, but not to confound it with the reſt; and they are in agreeable ſhapes, and melting into one another, but nevertheleſs ſufficiently determined.

Very commonly a picture conſiſts of a maſs of light, and another of ſhadow upon a ground of a middle tinct. And ſometimes 'tis compoſed of a maſs of dark at the bottom, another lighter above that, and another for the upper part ſtill lighter; (as uſually in a landſcape) ſometimes the dark maſs employs one ſide of the picture alſo. As a certain copy after *Paolo Veroneſe*, where is a large group of figures, the principal ones of the ſtory compoſe this lower brown maſs; architecture, the ſecond; more buildings with figures and the sky, the third; but moſt commonly in pictures of three maſſes, the ſecond is the place of the principal figures.

Of ſuch conſequence are theſe agreeable maſſes in a picture, that for the ſake of them, what is leſs material in a picture, muſt be diſpens'd with when both cannot be had. As the principal figure and action muſt be diſtinguiſh'd, thoſe limbs of a figure that are chiefly employed, ought to be made conſpicuous.

As the *tout-enſemble* of a picture muſt be beautiful in its maſſes, ſo muſt it be as to its colours. And as what is principal muſt be (generally ſpeaking) the moſt conſpicuous, the predominant colours of that ſhould be diffus'd throughout the whole. This *Rafaelle* has remarkably obſerv'd in the cartoon of St. *Paul* preaching; his drapery is red and green, and theſe colours are ſcatter'd every where, but judiciouſly; for ſubordinate colours, as well as ſubordinate lights, ſerve to ſoften and ſupport the principal ones, which otherwiſe would appear as ſpots, and conſequently be offenſive.

And when the ſubject does not neceſſarily require a due variety or beauty of tincts; or perhaps the picture, when thought to be finiſh'd, is found to want ſomething of this kind, a few red, or yellow leaves of trees, flowers of whatever colour, in ſhort, any thing otherwiſe indifferent may be flung in very advantageouſly.

In a figure, and every part of a figure, and indeed in every thing elſe, there is one part which muſt have a peculiar force, and be manifeſtly diſtinguiſhed from the reſt, all the other parts of which muſt alſo have a due ſubordination to it, and to one another. The ſame muſt be obſerv'd in the compoſition of an entire picture; and this principal, diſtinguiſh'd part ought (generally ſpeaking) to be the place of the principal figure and action: and here every thing muſt be higher finiſh'd; the other parts muſt be leſs ſo, gradually.

In the deſcent from the croſs of *Reubens*, the *Chriſt* is the principal figure. This body being naked and about the centre of the picture, would have been diſtinguiſhed as the heightening of this maſs of light; but not content with that, and to raiſe it ſtill more, this judicious maſter has added a ſheet in which the body is, and which is ſuppos'd to be uſeful to deliver it down ſafely, as well as to carry it off afterwards, but the main deſign is what I am obſerving, and for that 'tis admirably introduc'd.

Ananias is the principal figure in the *carton* which gives the hiſtory of his death, as the Apoſtle that pronounces his ſentence is of the ſubordinate group, which conſiſts of Apoſtles, (which therefore is ſubordinate, becauſe the principal action relates to the criminal, and thither the eye is directed by almoſt all the figures in the picture.) S. *Paul* is the chief figure in that carton, where he is preaching; and amongſt his auditors one is eminently diſtinguiſh'd, who is principal of that group, and is apparently a believer, and more ſo than any of them, or he had not had that ſecond place in a picture conducted by ſo great a judgment as that of *Rafaelle*'s.

Theſe principal and ſubordinate groups and figures are ſo apparent, that the eye will naturally fix firſt upon one, then upon the other, and conſider each in order, and with delight. Where 'tis not thus, the compoſition is leſs perfect.

It is to be noted, that the ſorcerer in the carton of his chaſtiſement, is the principal figure there, but has not the force in all its parts as it ought to have as ſuch, and to maintain the harmony. This is accidental, for 'tis certain his drapery was of the ſame ſtrength and beauty as that on his head, however it has happen'd to have changed its colour.

The ſhadows in the drapery of S. *Paul* alſo, in that carton, where the people are about to ſacrifice to him and *Barnabas*, have loſt ſomething of their force.

Sometimes the place in the picture, and not the force, gives the diſtinction; and ſometimes the painter happens to be obliged to put a figure in a place, and with a degree of force which does not ſufficiently diſtinguiſh it. In that caſe, the attention muſt be awaken'd by the colour of its drapery, or a part of it, or by the ground on which 'tis painted, or ſome other artifice.

Scarlet or ſome vivid colour is very proper on ſuch occaſions. In a picture of *Albano*, which Sir *James Thornhill* had, our Lord is ſeen at a diſtance as coming towards ſome of his diſciples; and tho' a ſmall figure, is nevertheleſs the moſt apparent in the picture by being placed on a riſing ground, and painted upon a bright part of the sky juſt above the horizon.

In a compoſition, as well as in every ſingle figure, or other part of which the picture conſiſts, one thing muſt contraſt, or be varied from another. Thus in a figure, the arms and legs muſt not be plac'd to anſwer one another in parallel lines. In like manner, if one figure in a compoſition ſtands, another muſt bend, or lye on the ground; and of thoſe that ſtand, or are in any other poſition, if there be ſeveral of them, they muſt be varied by turns of the head, or ſome other artful diſpoſition of their parts, as may be ſeen (for inſtance) in the *carton* of giving the keys. The maſſes muſt alſo have the like contraſt, two muſt not be alike in form or ſize, nor the whole maſs compoſed of thoſe leſſer ones of too regular a ſhape. The colours muſt be alſo contraſted and oppos'd, ſo as to be grateful to the eye. There muſt not (for example) be two draperies in one picture of the ſame colour and ſtrength, unleſs they are contiguous, and then they are but as one. If there be two reds, blues, or whatever other colour, one muſt be of a darker or paler tinct, or be ſome way varied by lights, ſhadows, or reflections. *Rafaelle*, and others, have made great advantage of changeable ſilks to unite the contraſting colours, as well as to make a part of the contraſt themſelves. As in the *carton* of giving the keys, the Apoſtle that ſtands in profile, and immediately behind St. *John*, has a yellow garment with red ſleeves, which connects that figure with S. *Peter* and S. *John*, whoſe draperies are of the ſame ſpecies of colours. Then the ſame anonymous Apoſtle has a looſe changeable drapery, the lights of which are a mixture of red and yellow, the other parts are bluiſh. This unites it ſelf with the other colours already mention'd, and with the blue drapery of another Apoſtle which follows afterwards; between which, and the changeable ſilk, is a yellow drapery, ſomething different from the other yellows, but with ſhadows bearing upon the purple, as thoſe of the yellow drapery of St. *Peter* incline to the red. All which, together with ſeveral other particulars, produce a wonderful harmony.

The exotick birds that are placed on the ſhore, in the foreground in the carton of the draught of fiſhes, prevent the heavineſs, which that part would otherwiſe have had, by breaking the parallel lines, which would have been made by the boats, and baſe of the picture.

Though a maſs may conſiſt of a number of little parts, there ought to be one, or more, larger, and as it were, governing the reſt, and this is another ſort of contraſt. The Lord *Burlington* has a good *Samaritan* by *Baſſau*, which is a fine inſtance of this. In the ſame picture, there are two knees of two ſeveral figures, pretty near together, and the legs and thighs of which make angles too much alike; but this is contraſted by one being naked, and the other clad, and over the latter a little ſort of ſaſh falls, which is an additional expedient.

There is an admirable contraſt in the carton of St. *Paul* preaching. His figure (which is a rare one) ſtands alone as he ought to do, and conſequently is very conſpicuous, which is alſo perfectly right. The attitude is as fine as can be imagin'd; but the beauty of this noble figure, and with it of the whole picture depends upon this artful contraſt I have been ſpeaking of; of ſo great conſequence is that little part of the drapery flung over the Apoſtle's ſhoulder, and hanging down almoſt to his waſte; for (beſides that it poizes the figure, which otherwiſe would have ſeem'd to have tumbled forwards) had it gone lower, ſo as to have as it were divided the out-line of the hinder part of the figure in two equal, or near equal parts, it had been offenſive; as it had been leſs pleaſing, if it had not come ſo low as it does. This important piece of drapery preſerves the maſs of light upon that figure, but varies it, and gives it an agreeable form; whereas without it, the whole figure would have been heavy and diſagreeable: but there was no danger of that in *Rafaelle*.

The naked boys in the carton of healing the cripple, are a farther proof of *Rafaelle*'s great judgment in compoſition. One of 'em is in ſuch an attitude as finely varies the turns of the figures; but here is moreover another kind of contraſt, and that is cauſed by their being naked, which how odd ſoever it may ſeem at firſt, and without conſidering the reaſon of it, will be found to have a marvellous effect. Cloath 'em in imagination; dreſs 'em as you will, the picture ſuffers by it, and would have ſuffered, if *Rafaelle* himſelf had done it.

'Tis for the ſake of this contraſt, which is of ſo great conſequence in painting, that this knowing man in the carton we are now upon, has plac'd his figures at one end of the temple, near the corner, where one would not ſuppoſe the beautiful gate was. But this varies the ſides of the picture, and at the ſame time gives him an opportunity to enlarge his buildings with a fine portico, the like of which you muſt imagine muſt be on the other ſide of the main ſtructure; all which together makes one of the nobleſt pieces of architecture that can be conceived.

He has taken a greater licence in the carton of the converſion of *Sergius Paulus*, where the architecture will be difficult to account for, otherwiſe than by ſaying, it was done to give the contraſt we are ſpeaking of. But this will juſtify it ſufficiently.

Nor is this contraſt only neceſſary in every particular picture; but if ſeveral are made to hang in one room, they ought to contraſt one another. This *Titian* conſidered, when he was making ſeveral pictures for King *Henry* VIII. as appears by a letter he wrote to that Prince, which (amongſt others of *Titian* to the Emperor and other great men) is to be found in a collection of letters, printed at *Venice*, *ann.* 1574.

There is another ſort of contraſt, which it is to be wonder'd painters have not more conſider'd than we generally find, and that is, making ſome fat, and ſome lean people; ſuch a face and air as Mr. *Locke*'s, or Sir *Iſaac Newton*'s, would ſhine in the beſt compoſition that ever *Rafaelle* made, as to expreſs their characters, would be a task worthy of that divine Hand. In the cartons, there is one or two figures ſomething corpulent, but I think not one remarkably lean.

The maſters to be ſtudied for compoſition are *Rafaelle*, *Rubens* and *Rembrandt* moſt eſpecially, though many others are worthy notice, and to be carefully conſider'd; amongſt which, *V. Velde* ought not to be forgotten, who tho' his ſubjects were ſhips, which conſiſting of ſo many little parts, are very difficult to fling into great maſſes, has done it by the help of ſpread ſails, ſmoak, and the bodies of the veſſels, and a judicious management of light and ſhadows. So that his compoſitions are many times as good as thoſe of any maſter.

The more to be convinc'd of the advantage of compoſition, as well as the better to comprehend what I have been ſaying, it may not be amiſs to compare ſome of thoſe things, I have inſtanced in as good, with others that are not ſo; ſuch as the famous deſcent of the croſs by *Daniele da Volterra*, where all is confuſion; the crucifixion of our Lord between two thieves by *Rubens*, grav'd by *Bolſwart*, where, tho' they are diſtinct, they are of diſagreeable forms, and unconnected.

CONCORD is repreſented in painting, *&c.* by a grave beautiful lady in an antique dreſs, holding in her right hand a baſon with a heart and pomegranate in it, and a garland of fruits and flowers on her head, and in her left a ſcepter; on the top of which are various flowers and fruits.

The heart and pomegranate denote *Concord*, becauſe the pomegranate is full of little grains cloſely united, to that degree, that if the roots be ſeparated, they mutually twiſt together again.

CONCORD is alſo repreſented in painting, as a lady in a sky coloured robe and a yellow mantle, holding in her right hand a charger for ſacrifice, and in her left, a *cornucopia* with the word *concordia:* or thus; as a fair virgin, holding in one hand a pomegranate, and in the other a bunch of myrtle.

The reaſon of which is, that the nature of theſe trees is ſuch, that if they are planted, although at a good ſpace from one another, they will meet, and with twining embrace one another.

CONFIDENCE is repreſented in painting, *&c.* by a woman with her hair hanging about her ears, bearing up a ſhip with both her hands. The ſhip ſhews, that although the ſea be terrible, yet ſhe is confident, that by the help of this ſhip, ſhe may truſt herſelf with that barbarous element threatning ruin and deſtruction.

CONJUGAL LOVE is repreſented in painting, *&c.* by a man at a woman's right hand, both clad in purple, one gold chain encircles both their necks, having a heart for a pendant ſupported only by one hand of each.

The chain denotes matrimony, ordain'd by nature and the divine law, which would have the husband and wife to be one fleſh and bone, not to be ſeparated but by death.

CONNOISSANCE, [in painting] a skill in that particular ſcience. See *Connoiſſeur.*

CONNOISSEUR. It is not enough, ſays Mr. *Richardſon*, to be an ingenious man in general, nor to have ſeen all the fineſt things in *Europe*, nor even to be able to make a good picture, much leſs the having the names and ſomething of the hiſtory of the maſters; all this will not render a man a good *Connoiſſeur*, to be able to judge of the goodneſs of a picture; moſt of thoſe qualifications are neceſſary, which the painter himſelf ought to be poſſeſs'd of, that is all that are not practical; he muſt be maſter of the ſubject, and if it be improvable, he muſt know it to be ſo, and wherein; he muſt not only ſee and judge of the painter, in what he has done, but muſt know moreover, what he ought to have done; he muſt be acquainted with the paſſions, their nature, and how they appear on all occaſions.

He muſt have a delicacy of eye, to judge of harmony and proportion of beauty of colours and accuracy of hand; and laſtly, he muſt be converſant with the better ſort of people, and with the antique, or he will not be a good judge of grace and greatneſs. And he muſt have not only a ſolid, but an unbiaſſed judgment.

The knowledge of hiſtory is abſolutely neceſſary to a *Connoiſſeur*, not only that which may enable him to judge, how well the painter has manag'd ſuch and ſuch a ſtory, which he will have frequent occaſion to do; but the particular hiſtory of the arts, and eſpecially of painting.

CONSCIENCE is repreſented in painting, *&c.* by a lady with a heart in her hand before her eyes, where is written in letters of gold, OIKEIA ΣΥΝΕΣΙΣ, that is ones own *Conſcience* ſtanding on her legs, between a flowry meadow and a field full of thorns and briars.

The heart ſhews, that none can be hid from himſelf, the flowers and thorns, that there are two ways, good and bad, the part of *Conſcience* is to chuſe; in the one, we meet the prickings of vice, in the other, the fragrant ſmell of virtue.

CONSTANCY is repreſented in painting, &c. by a woman embracing a pillar with her right arm, and holding a drawn ſword in her left hand over a fire on the altar, as if ſhe had a mind to burn her arm and hand.

The column ſhews her ſtedfaſt reſolution not to be overcome, the naked ſword, that neither fire nor ſword can terrify courage arm'd with *Conſtancy.*

CONTAGION is repreſented in painting, &c. by a young maid in a mournful pitiful habit, ſhe holds a walnut branch in one hand, and lays the other on a baſilisk with a terrible aſpect; on the other ſide is a ſtripling languid and ſickly, lying half dead upon the ground.

Young, becauſe more ſubject to infection by diſorderly living and careleſſneſs; pale and languid denotes the virulency conſuming by degrees, the habit the doleful condition of the infected, ending often in death, the bough denotes *Contagion,* as does the baſilisk, whoſe very breath and looks are contagious.

CONTENTMENT is repreſented in painting, &c. by a ſpark pompouſly adorn'd with a ſword by his ſide, the ornaments on his head are a plume of feathers and jewels, a looking glaſs in one hand, and in the other, a ſilver baſon clapt to his thigh full of money and jewels.

He looking in the glaſs ſhews, that if a man be ignorant of his own good, he cannot be content, therefore looks upon his own fine clothes, money and jewels, with much ſatisfaction and content.

CONTOUR, [in painting, &c.] the out-line or that which terminates and defines a figure.

A great part of the skill of the painter conſiſts in managing the *Contours* well.

The *Contour* of a figure makes what we call the *draught* or *deſign.*

The *Italian* painters ordinarily call the lineaments of the face, the *Contour* of it.

CONTRAST in painting and ſculpture, expreſſes an *oppoſition* or difference of poſition, attitude, &c. of two or more figures, contriv'd to make variety in a painting.

Thus when in a group of three figures, one is ſhewn before, another behind, and a third ſideways, there is ſaid to be a *Contraſt.*

M. *de Piles* defines *Contraſt* an oppoſition between the lines, which form objects, by means whereof they ſet off one the other.

A *Contraſt* well managed, is one of the greateſt beauties of a painting.

The *Contraſt* is not only to be obſerv'd in the poſition of ſeveral figures, but alſo in that of the ſeveral members of the ſame figure; thus if the right arm advance the furtheſt, the right leg is to be hindmoſt, if the eye be directed one way, the arm to go the contrary way, *&c.*

The *Contraſt* alſo muſt be purſued even in the drapery.

CONVERSATION is repreſented in painting, *&c.* by a young man with a ſmiling countenance clothed in green, a laurel garland on his head, a *Mercury's* rod in his hand, twiſted about with a myrtle, and pomegranate and a human tongue at the top with a ſcrowl on which is written *væ ſoli.*

His poſture ſhews him inclin'd to entertain ſomebody, the ſcrowl woe to him that is alone; the two branches ſhews mutual amity by converſation, the tongue expreſſeth the mind in company.

CONVERSION is repreſented in painting, *&c.* by a naked lady at years of diſcretion holding a green ribbon inſcribed in *te Domine ſperavi*; on the ground are ſplendid garments, ſhe looks up to heaven whence proceeds a ray, ſhe is bathed in tears, her hands a-croſs, a *Hydra* at her feet gaping.

Fair denotes *Converſion* to God, her years, her being averſe from all exceſſes, her nakedneſs, purity, and deſpoil'd of all worldly affections by her rich garments upon the ground.

HENRY COOK, was an *Engliſh* gentleman and hiſtory painter, he was not only a great critick in painting, but alſo a good performer, as appears in many publick pieces of his, *viz.* the altar-piece at *New College Chapel* in *Oxford*, what he has done at *Chelſea*, at *Hampton-Court* on many cielings and ſtair caſes of this town and kingdom. He painted many fine copies of the *Cartoons* of *Raphael*, &c. which are particularly remarkable, being drawn in turpentine oil, after the manner of diſtemper; of which he is ſaid to have been the inventor, he died in *London*, *November* 18. 1700, aged near fifty eight, and lies buried in St. *Giles's* church.

Mr. SAMUEL COOPER, born in the year 1609, a ſcholar of Mr. *Hoskins*, and ſtudied *Vandike* or *Van-Dick*, liv'd at *London*, excell'd in portraits and miniature, died in the year 1672, aged ſixty three years.

Samuel COOPER, born in *London* 1609. was an imitator of *Van Dyck.*

His pencil was generally confin'd to a head only, and indeed, below that part he was not always ſo ſucceſsful as could be wiſh'd, but for a face and all the dependencies of it, *viz.* the graceful and becoming air, the ſtrength, relievo and noble ſpirit; the ſoftneſs and tender livelineſs of fleſh and blood; and the looſe and genteel management of the hair. His talent was ſo extraordinary and for the honour of our nation, it may without vanity be affirmed, he was (at leaſt) equal to the moſt famous *Italians*, and that hardly any one of his predeceſſors has ever been able to ſhew ſuch perfection in ſo narrow a compaſs; he died *anno* 1672, and lies buried at *Pancras* church, aged ſixty three.

ALEXANDER COOPER, was the elder brother of *Samuel Cooper*, Eſq; he perform'd well in miniature, and going beyond ſea, became limner to *Chriſtiana* Queen of *Sweden*; yet was far exceeded by his brother *Samuel*, who was much the greater maſter. He did likewiſe a landſcape in water colours exceeding well, and was accounted an extraordinary draftſman.

COPAL. A gum of an agreeable ſmell, reſembling that of incenſe brought from *New-Spain*, where it oozes out from inciſions made in the bark of a large tree, much after the manner in which the vine yields its water, when cut in the ſpring.

'Tis very rare, when good, 'tis of a fine tranſparent yellow and melts eaſily.

For want of this, there is another kind brought from the *Antilles*, which is almoſt the only one known among the druggiſts. Its chief conſumption is in making *varniſh*.

Of the CHOICE *of* COPIES.

1. In chuſing a pattern to draw by, you ought to obſerve, firſt, that it be well deſign'd, ſecondly, that it be well cover'd.

2. As to the well deſigning, ſee that it be true in every part, and that the proportion of the figure be juſt and anſwer to the life.

3. If the picture be a fiction, ſee that it be done boldly, not only to exceed the work (but alſo the poſſibility) of nature, as in *centaurs*, *ſatyrs*, *ſyrens*, *flying horſes*, *ſea-horſes*, *tritons*, *nereids*, &c.

4. Natural figures ſhew property, and are requir'd to agree with the life; forced figures expreſs novelty, and are to be beautified by exorbitancies according to the fancy of the painter, without limitation; novelty cauſes admiration, and admiration, curioſity, and a kind of delight and ſatisfaction.

In the well colouring, know, that in obſcurity or darkneſs, there is a kind of deepneſs; the ſight being ſweetly deceiv'd gradually in breaking the colours, by inſenſible change from the more high to the more dull.

In the rainbow this mixture is perfect; the variety of colours are thoroughly diſpers'd (like atoms in the ſun beams) among one another to create its juſt appearance.

See that the ſwellings of the work agree to the exactneſs of nature, and as the parts thereof require, without ſharpneſs in outlines, or flatneſs within the body of the piece.

As alſo, that each hollowneſs exactly correſponds to due proportions.

Laſtly, view with attention the paſſions, as joy, ſorrow, love, hatred, fear, hope, *&c.* and ſee that they correſpond with their proper poſtures; for a touch of the pencil may ſtrangely alter a paſſion to its juſt oppoſite or contrary, as from mirth to mourning, *&c.*

COPPER, a hard, dry, heavy, ductile metal, found in mines in ſeveral parts of *Europe*; but moſt abundantly in *Sweden.*

Copper is of all metals the moſt ductile and malleable, after gold and ſilver.

By an analyſis it appears to be compos'd of a ſulphur ill digeſted, a yellowiſh mercury and a red ſalt.

It is found both in duſt and in ſtones; each of which are firſt well waſh'd, to ſeparate them from the earth, wherewith they are mixt. In this ſtate 'tis call'd *Virgin Copper.*

After it has been waſh'd, 'tis melted, and the melted matter is run into a kind of moulds, to form large blocks, by ſome call'd *Salmons*, and by others *Pigs of Copper.*

In order to render it more pure and beautiful, they melt it again once or twice; ſome of its coarſe, earthy parts being left each fuſion, and a quantity of tin and antimony added in each. In this ſtate it is call'd *Roſe Copper.*

Of a mixture of this and *lapis calaminaris* is form'd braſs.

Copper melted together with twenty two or twenty three pounds of fine tin *per* quintal makes bell metal.

Copper melted with calamine quantity for quantity makes braſs.

Copper and braſs melted in equal quantities make what the *French* call *Bronze*, us'd for figures, ſtatues, *&c.*

Copper turns white by an unction of ſpirit of wine and orpiment.

Pliny ſays there is a *Copper* naturally white, found underneath the ſilver mines.

The uſe of *Copper* is very extenſive; among other works of *Copper* may be reckon'd thoſe of braſs, bell metal, pot metal, *&c.* which are all compoſitions where *Copper* makes the prevailing ingredient.

To blanch COPPER. Take arſenick eight ounces, ſal-nitre and white *tartar*, of each two ounces, *borax* one ounce, reduce them to fine powder, cement the *Copper* therewith, by laying thin plates, layer upon layer, after forty eight hours of a cementing heat, (the crucible being ſtrong, well ſtopt, cover'd and ſtrongly luted) encreaſe the fire and cauſe it to melt all down together.

Another way to do the ſame. Take white wine vinegar, ſtrong lye made of wood aſhes ſo ſtrong as to bear an egg, of each four pounds, ſulphur and hog's blood of each one pound, powder the *ſulphur* and mix all together, and digeſt in an earthen pot cloſe covered for eight days, then ſtrain it.

2. Take eight pounds of *Copper*, melt it and quench it in the aforeſaid lye, do this four times, and then will the *Copper* be in meaſure prepar'd.

3. Take white arſenick, ſheeps ſuet tied up of each a pound, white lead four ounces, put them all together in a kettle keeping continually ſtirring them till they boil to a powder which keep for uſe.

4. Take the *Copper* before prepar'd, and melt it again a fifth time, to which put a little of your prepar'd powder of *arſenick* by little and little at a time (the *Copper* being firſt melted) ſtirring it with a wooden ſtick till it is diſſolv'd in the metal, then caſt it into an ingot.

The former powder will ſerve for eight pounds of *Copper*.

Another way. Take ſublim'd *arſenick* two ounces, common ſalt two ounces, ſublime them together three times, then is it fixed.

2. Take fine *ſilver* in *filings* or leaves half an ounce, *mercury ſublimate* a ſufficient quantity, grind them well upon a marble ſtone, to which add the former prepar'd *arſenick* with ſome fixed *ſal armoniac*.

3. Grind them well together with wine vinegar diſtill'd, in which ſome *borax* has been diſſolv'd; then let them dry, when they are dry wet them again with the ſaid vinegar, and dry them again upon a ſoft fire, do ſo five times.

4. Take fine ſilver one ounce, and as much of the aforeſaid compoſition, of the prepar'd *Copper* eight ounces, mix and melt them together, and it will be in appearance next to perfect.

To fix SAL ARMONIAC *for this work.* 1. Take *Sal Armoniac* ſublim'd to a perfect whiteneſs, put it into a glaſs alembick with head and receiver, caſting upon the *Sal Armoniac* ſome good diſtill'd vinegar, ſo as to cover it a hand's breadth, and diſtil it with a ſoft fire.

2. Then put upon it more freſh *vinegar* and diſtil again, repeat this till the *Sal Armoniac* remains in the bottom, afterwards let the fire go out of itſelf, and keep the oil cloſe ſtopt for uſe.

3. If you take *mercury* two ounces, and make it hot in the fire, then drop on it three drops of the oil, and the *mercury* will be congeal'd into a pure metal; of this one part will make ten parts of *Copper*, as fair as *ſilver*; the ten parts of *Copper* being firſt melted and the *mercury* one part being caſt upon it.

To fix ARSENICK. Take a ſtrong lye of aſhes and *quick lime*, filter it and diſſolve *Arſenick* with it, then evaporate the humidity by boiling, and the *Arſenick* will be prepar'd and fixt.

To whiten COPPER *or* BRASS *ſuperficially.* Take *ſal armoniac*, *alum*, *nitre* of each alike quantity, put to them a little *filings* of *ſilver* refin'd or *leaf ſilver*; mix them well together, and put it into the fire till it be red hot in a crucible, and till it has done ſmoaking. Then moiſten this powder with ſpittle, and rub either *Copper* or *Braſs* with it, and it will be white.

To whiten COPPER or IRON. Take calx of *ſilver*, grind it with two parts of calcin'd precipitate of *arſenick*, and one part of white precipitate *mercury*, imbibe them with water made of *ſal nitre*, *ſal armoniac*, and litharge of each equal parts, and this till they have drunk up their weight of the water, put one part of it on four parts of prepar'd *Copper* or *Iron*.

Another way to do the ſame. Take calcin'd *ſilver*, *tin* calcin'd and diſſolv'd of each a like quantity, mix, dry and cover it with twice as much ſublimed *arſenick*.

Another way. Take calcin'd *ſilver*, *arſenick*, ſulphur ſublim'd and ground, *ſal armoniac* of each a like quantity, mix and ſublime all three times, and caſt one part upon ſix parts of prepar'd *Iron* or *Copper*.

Another. Take *realgar* one ounce, *quickſilver* ſublim'd three ounces, *tartar* calcin'd one ounce, grind and incorporate them, and put them into a vial with a neck twelve inches long, and its orifice ſo wide that two fingers may enter; lute it and ſet it over a fire cover'd with a cloth.

Firſt make a gentle fire for a quarter of an hour; afterwards augment the fire underneath, and round about till the furnace be very hot and red; when all is cold, break the veſſel and take out the metalline matter. This may eaſily be brought to perfection.

Another for the ſame purpoſe. Upon *tutia* ſublime one part of *mercury* ſublimate, and two parts of arſenick ſublim'd until it ſhall have ingreſs. This clearly and very ſpeciouſly ſublimes *Copper*.

The way to calcine little plates of COPPER *to tinge glaſs of a blue colour.* We have ſhewn the way to make *crocus martis* for colouring glaſs, and now we will ſhew that of copper, which is very near in nature to the other, and which diſſolves in the ſame acids and corroſives. *Venus* as well as *Mars* (or copper as well as iron) give us different colours, which proceed from different ways of preparing them.

Merret pretends that *braſs* gives us a finer blue than *copper*, by reaſon of the *lapis calaminaris*, which is mixt with it, and partly cauſes the colour.

Of all metals, *Copper* is only uſed (as allay) to give malleability to gold and ſilver in coin; it melts eaſy in an indifferent heat, but it is calcined into powder with difficulty. There are ſeveral ways of calcining copper; here follows five of them, by help of fire. The firſt is of *Copper* alone, without any addition; the ſecond, by the addition of *ſulphur*; the third, by *vitriol*; the fourth, of *braſs* alone divers ways; the fifth, by a preparation of *vitriol* of *Venus*. Theſe preparations are the beſt; and of more value than thoſe prepared by ſpirits and corroſives.

The little plates or leaves, whereof we are now to ſhew the preparation, are a ſort of *copper* or braſs exceeding thin, approaching the colour of gold called feſtoons; theſe plates are made of this colour by *lapis calaminaris*, which does not only colour the *Copper*, but augments its weight. This braſs being well calcin'd, tinges glaſs of a blue and ſea green; the way to calcine it is thus.

To avoid the expence of buying new, you may make uſe of thoſe leaves which have been already uſed and work'd, they being good, and cut them with ſciſſars into little pieces, and put them into a crucible covered and luted in the mouth of a furnace to calcine, and let them ſtand there four days, at a coal fire, ſo that the leaves may not melt, for then they would be unfit for this uſe. The four days being expired, the whole will be calcined; beat them on a porphyry ſtone, and ſearce them through a fine ſieve, and you will have a blackiſh powder, which you muſt ſpread on tiles, and put it into the ſame furnace for four days longer; then take it off, and blow off the aſhes that may be fallen on it; then reduce it again into powder, ſearcing it through a fine ſieve as before, and keep it for uſe.

You may know when it is well calcined, if the glaſs riſes and ſwells when you put it upon it; if it does not, you muſt calcine other leaves, thoſe being not ſerviceable, by reaſon they are burnt in the calcination.

Another way of calcining theſe leaves of COPPER, *to make a very tranſparent red, yellow and chalcedony.* Take the ſame leaves as before-mentioned, cut them into ſmall pieces, and ſtratify them with *ſulphur* pulverized in a crucible, covered and luted; then ſet them on burning coals at the mouth of the oven to calcine for twenty four hours; then take it out, and grind it ſmall; then put it into an earthen veſſel in a reverberatory furnace, where leaving it ten hours, take it out and powder it, then keep it for uſe.

COPPER, *to calcine to a red powder, which ſerves in ſeveral proceſſes for colouring glaſs.* Altho' copper be of the ſame nature as braſs, which ſerves to colour glaſs blue, yet there is ſome difference between them; for the latter will tinge it of ſeveral colours, which proceeds from the *lapis calaminaris*, and ſome other mixtures in the preparation.

To make this powder, take copper in thin plates, what quantity you pleaſe, put it in a large crucible, and ſet it into a furnace, 'till it be calcin'd, without melting; then being cool'd, reduce it into powder, which will be very red, and ſearce it; of this divers uſes may be made, as will be ſhewn in many places.

To calcine COPPER *thrice for colouring glaſs.* The ſame red powder in the preceding chapter ſerves here.

Lay that powder on tiles, and calcine it again in the furnace for four days, and it will become black, and coagulated into one maſs.

Reduce it to powder and ſearce it, and calcine it again for five or ſix days in the ſame furnace, and it will become grey, without coagulating any more, or running into lumps, and will be in a condition fit to be diſſolv'd.

This powder the *Italians* call *ramina di trecotte*, and of it is made a sky colour'd blue, the colour of *turkois*, the green of *emerald*, and ſeveral other colours.

It muſt not be calcin'd above three times, becauſe it would no longer colour glaſs.

It may be known whether it be calcin'd well, by caſting ſome of it into a pot of boiling glaſs; if it ſwells, it is enough; if not, it muſt be ſet again into the furnace for twenty four hours, or rather begin a new proceſs.

An eaſier and leſs chargeable way of making thrice calcin'd COPPER. This, as it is leſs expenſive, will alſo be almoſt equal in beauty.

Take ſcales made by braziers in making pots, kettles, and other works of braſs, which is cheaper by far then new copper.

Theſe ſcales need not be ſtratified, like the copper before mentioned, which is troubleſome; there is no need of any thing but to waſh them from all filth, to dry them well, and to put them into one or more crucibles, and to ſet them into the mouth of a reverberatory furnace for the ſpace of four days. Then being at length cool'd, they are to be pounded or ground and ſearc'd.

Then the powder is to be ſet a ſecond time into the ſame furnace to reverberate for four days more, and you will have little balls of a black colour, which muſt be pounded and ſearc'd again, and then put the third time into the reverberatory; then after four other days, reduce them to powder as before.

Thus will it be prepar'd with leſs expence, and as good for colouring of glaſs; which may be known very eaſily, by making

ing a trial of it on melted glaſs; for if it makes it riſe when you caſt it on, it is right.

To tinge COPPER *of a gold colour.* Take *copper* and *lapis calaminaris*, of each eight drams, of *tutty* four drams. Heat the copper red hot twice, quenching it in urine, doing the like by the *lapis* and the *tutty*. Take of the diſſolv'd copper an ounce, adding to it two ounces of honey; boil them till the honey look black, and is ſo dry, that it may be powdered, when beat with the *lapis* and *tutty*; then boil them again till the *copper* is melted, and it is done.

Another way. Take the *gall of a goat* and *arſenick* of each a ſufficient quantity, and diſtil them; then waſh the *copper*, being firſt made bright in this water, and it will change into the colour of gold.

Another way. Melt *Copper*, and put in a little *zink* in filings, and the *Copper* will have a glorious golden colour.

To make COPPER *of a white colour.* Take *ſublimate* and *ſal armoniack* of each a like quantity, boil them in vinegar, in which quench the *copper*, having firſt been made red hot, and it will be like ſilver.

Another way. Heat *copper* red hot divers times, and quench it in oil of *tartar per deliquium*, and it will be white.

Another way. Take *arſenick* an ounce and a half, *mercury ſublimate* an ounce, of *azure* half an ounce; mix them with good and pure greaſe like an ointment, and with this anoint any copper veſſel; then put that veſſel into another, and ſet it into a digeſtive heat, letting it ſtand for two months; after which, cleanſe it with a bruſh and water, and it is done.

Another way. Take calcin'd *arſenick* with *ſalt-petre*, and *mercury ſublimate*, which caſt upon melted copper, and it will be white like ſilver.

To ſoften COPPER. Melt burnt braſs in a crucible with *borax*, quench it in *linſeed* oil, and then beat it gently on an anvil; then boil it again, and quench it in oil as before; doing this five or ſix times till it is ſoft enough, and this will neatly unite with gold, of which you may put in more by half than you can of other braſs.

COPPER GREEN. To make this, take a pound of right *French verdegreaſe* made at *Montpelier*, that being the beſt, becauſe the *verdegreaſe* made at any other place will fade.

To this add three ounces of cream of tartar; let them be both reduc'd to a very fine powder; but be ſure to take care to ſtop your noſe while the *verdegreaſe* is pounding, and hold a bunch of fine linen in your mouth, to breathe through; or otherwiſe the ſubtil powder of the verdegreaſe will offend you, When this is done, mix both the powders in two quarts of water, and boil them in an earthen pipkin to the conſumption of one half; then ſet it by till it is cold; then ſtrain it, and put the liquor into a glaſs bottle; ſtop it up, and let it ſtand to ſettle till the liquor be very clear, and ſo you will have a delicate green water for waſhing prints, *&c.*

But the *verdegreaſe* not being always of a goodneſs, ſometimes the colour may not prove ſo deep as you would have it for ſome uſes.

To remedy this, put ſome of it into a broad earthen diſh, and ſet it over a chafing diſh of coals, and by a gentle heat, cauſe ſo much of the liquid part to evaporate, till by trying on a paper, and letting of it dry, the colour is as you would have it.

Here you may note, that if it ſhine too much when dry, it is not as it ought to be, for it is not rightly made, if it does any more than juſt ſhine; and if you cannot make the colour by evaporating it (as before) without making it ſhine too much, the beſt way will be to add ſome more verdegreaſe, and boil it up again, till it becomes a tranſparent deep willow green.

COPPERAS } a mineral form'd in copper mines, and which
COPERAS } is properly a kind of vitriol.

Copperas is purified and prepar'd in the ſame manner as alum and ſalt petre, by paſſing thro' ſeveral lixiviums till it be wholly reduc'd to cryſtal.

There is *Copperas* of *England*, of *Piſa*, *Germany*, *Cyprus*, *Hungary* and *Italy*; which only differ from each other in colour and perfection, being all the ſame mineral.

White Copperas is the *Copperas* of *Germany*, calcin'd, laid in water, then filtrated and reduc'd to ſalt; of which as it coagulates, they form cakes of forty or fifty pounds each. Such are thoſe brought from *Goſlelar* in *Germany.*

The *Saxon Copperas*, before it is whiten'd, is of a bluiſh green, clear and tranſparent.

The *Engliſh Copperas* is of a fine green; that of *Cyprus* and *Hungary* of a sky blue, in pieces cut like the point of a diamond; that of *Piſa* and *Italy* is likewiſe green, and the laſt is as tranſparent as glaſs.

Copperas is of conſiderable uſe in many preparations; but eſpecially in dying. The hatters alſo uſe it in their dye, and this and galls are the ingredients that compoſe writing ink.

The ordinary *Engliſh Copperas* is made of a kind of ſtones found on the ſea ſhore in *Eſſex*, *Hampſhire*, and ſo weſtward, ordinarily call'd *gold ſtones*, from the colour; they abound with much iron.

To prepare the *Copperas* from them, they are laid in heaps or beds under ground. In proceſs of time, they ſwell and ferment, and by degrees a humour diſtils out, which drawn into a ciſtern, and being afterwards boil'd, in the boiling ſhoots into thoſe cryſtals we ſee it in.

CORAL is a production of the ſea, which is reckoned in the claſs of marine plants.

Mr. *Kircher* ſuppoſes, that there are whole foreſts of it at the bottom of the ſea; and Mr. *Tournefort* aſſerts, that it multiplies by ſeed, tho' neither its flower nor grain be known.

So then, if it be a plant, it has roots, by which it is faſtened to the rock on which it grows; and theſe roots are covered with a bark, beſet with ſtarry pores, which traverſe them from top to bottom.

Above theſe roots is the woody part (if we may ſo call a matter that reſembles ſtones, rather than wood.)

It is divided into branches like other plants. The extremities of it are ſoft and rounded into little bowls, uſually divided into ſix cells. Theſe bowls are accounted a kind of pods, which contain the ſeed of the coral.

M. le Comte de Marſigli obſerves, it grows chiefly in grotto's, whoſe aperture or mouth opens to the ſouth, and the vault or concave arch is nearly parallel to the ſurface of the earth.

As to its growth, 'tis neceſſary that the ſea be as quiet and ſtill as a pond; it vegetates contrary to almoſt all other plants, the foot of it adhering to the top of the grotto, and its branches extending downwards.

M. de Marſigli is of opinion, that its ſubſtance was originally fluid; and that which confirms the notion is, that the ſame ſubſtance does ſometimes line the inſide of a ſhell, which it could never enter, but in form of a fluid.

The antients were of opinion, that *Coral* was ſoft while it continued in the bottom of the water, and that it only became hard and ſolid by the impreſſion of the air. But the moderns have by experience found to the contrary.

There are properly but three kinds of *Coral*, *red*, *white* and *black*; the white is the rareſt, and moſt eſteem'd; but the red is the moſt in uſe. It is procur'd by fiſhing.

It is to be choſen thick, ſmooth and ſhining, and of a beautiful red, not covered with any tartarous matter.

CORAL FISHERY. There are ſeveral places where this fiſhery is carried on, as the *Perſian Gulf*, the *Red Sea*, the coaſts of *Africa* towards the *Baſtion* of *France*, the iſlands of *Majorca* and *Corſica*, and the coaſts of *Provence* and *Catalonia*.

The method of fiſhing is pretty much the ſame in all places, with that us'd at the *Baſtion* of *France*, where there is an eſtabliſhed fiſhery, under the direction of a company, and is as follows.

Each boat is mann'd with ſeven or eight men, commanded by the patron or proprietor; the caſter throws a machine (which performs the office of a caſting net) that tears up the coral from the bottom of the ſea; the other ſix manage the boat. This machine is compos'd of two beams ty'd a croſs, with a leaden weight to preſs them down. To theſe beams is faſtened a great quantity of hemp, looſely twiſted round, among which they mix ſome ſtrong nets.

The machine being thus furniſh'd, is let down into the ſea, and when the *Coral* is pretty ſtrongly entangled in the hemp and the nets, it is drawn up by a rope, which is unwound, according to the depth, and which ſometimes requires half a dozen boats crews to draw. If the cord happens to break, the fiſhermen are in great danger of being drowned.

Before the fiſhers go out, they agree on the price of the *Coral*, which is ordinarily at the rate of 4 *s.* 6 *d.* *per* pound.

The time of the *Coral* fiſhery is from *April* till *July*, which when it is over, and in a ſeaſon uſually amounts to twenty five quintals of *Coral* to each boat, this is divided into thirteen parts; of which the patron or maſter *coraller* has four, the caſter two, and each of the ſix companions one. The thirteenth being reſerv'd for the company.

To make artificial CORAL. Take the horns of a goat, ſcrape or ſhave them, reduce them to powder, ſteep them in a ſtrong lye made of the aſhes of the wood of an aſh, fifteen days together; then take it out of the lye, and mix it with cinnabar, diſſolv'd in water; hang it over an eaſy fire till it grow thick, and then if it have the right colour of *Coral*, make it into what form or faſhion you pleaſe, and poliſh it according to art.

Another. Take *Cinnabar* well beaten, and apply a layer thereof on a piece of wood well dry'd and poliſh'd, being firſt moiſtened with ſize; then poliſh it again, and for varniſh rub it over with the white of an egg.

CORRECTION is repreſented in painting, *&c.* by an old crabbed woman ſitting upon a bench with a whip in her left hand, and a pen in her right with which ſhe is correcting a book.

Old and croſs grained to ſhew that correction is a prudent act in him that gives it, and grievous to him that receives it, and therefore ſhe has a rod in one hand, and a pen in the other; the book contains the cauſe of complaint and *Correction.*

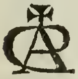
PADRE GIACOMO CORTESI *call'd* BORGOGNONE, born in the year 1605, excell'd in battles, died in the year 1675.

PIETRO *di* COSIMO, born in the year 1441, ſcholar of *Coſimo Roſelli*, liv'd at *Florence*, excell'd in painting bacchanals and maſquerades, died in the year 1521, aged eighty years.

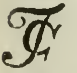
COSMOGRAPHY is repreſented in painting, *&c.* by an ancient lady in a sky coloured ſtarry veſtment, under which is another of an earthy colour, ſtanding betwixt two globes, the celeſtial on the right ſide, and the terreſtrial on the left; holding an aſtrolabe in her right hand, in her left the *Roman* radius.

She is ancient becauſe ſhe derives her pedigree from the creation of the world. Her garments denote her participating both of heaven and earth, as do the globes, as being the inſtruments, with which ſhe takes the diſtance and magnitude of ſeveral ſtars and the operations upon earth.

COSTUME, [in painting] as to obſerve the *Coſtume*, is to make every perſon and thing to ſuſtain the proper character; and not only to obſerve the ſtory, but the circumſtances, the ſcene of action, the country or place, but to make the habits, arms, manners, proportions, and the like to correſpond.



PETER COTTART, an engraver of vaſes us'd this mark.



JOHN COVAY, who engrav'd the works of Mr. *Vouet*, and others us'd this mark.

COUCH, in *painting*, is a term us'd for each lay or impreſſion of colour, either in oil or water; wherewith the painter covers his canvaſs, wall, wainſcot or other matter to be painted.

Thus they ſay, a painting has had its laſt *Couch* or lay; a ceiling has had two *couches*, there is a great deal of art in *couching* the colours well one after another.

The word is alſo us'd for a lay or impreſſion on any thing to make it more firm and conſiſtent, or to ſkreen it from the weather.

Thus paintings are cover'd with a *Couch* of varniſh; a canvas to be painted, muſt firſt have two *couches* of ſize before the colours are laid.

Two or three *couches* of white-lead are laid on wood before the *Couch* of gold is apply'd.

The leather gilders lay a *Couch* of water and whites of eggs on the leather, before they apply the leaf gold or ſilver.

The *gold wire-drawers* alſo uſe the word *Couch*, for the gold or ſilver leaf, wherewith they cover the maſs to be gilded or ſilvered; before they draw it through the iron, that is to give it its proper thickneſs.

The gilders uſe the term *Couch* for the quantity of gold and ſilver leaves, apply'd on the metals in gilding or ſilvering. Each *Couch* of gold is but one leaf or two at moſt, and each of ſilver three, to gild.

If the gilding be hatch'd, there are requir'd from eight to twelve *Couches*, and only three or four, if it be without hatching.

To ſilver, there are requir'd from four to ten *couches*, according to the beauty of the work.

COUNTER-LIGHT, } a window or light oppoſite to any
COUNTER-JOUR, } thing, which makes it appear to a diſadvantage; a ſingle *Counter-Light* is ſufficient to take away all the beauty of a fine painting.

COUNTER-DRAWING in *painting*, &c. is the copying a deſign or painting by means of a fine linen cloth, an oil'd paper or other tranſparent matter; whereon the ſtrokes appearing through, are follow'd and trac'd with a pencil, with or without colour.

Sometimes COUNTER-DRAWING is done on glaſs, and with frames or nets divided into ſquares with ſilk or with thread, and alſo by means of inſtruments invented for the purpoſe, as the *parallelogram*. Which ſee.

COUNTER-PROOF in rolling preſs printing, a print taken off from another freſh printed; which by being paſs'd through the preſs gives the figure of the former, but inverted.

To COUNTER-PROOVE is alſo to paſs a deſign in black lead, or red chalk through the preſs, after having moiſten'd with a ſpunge, both that and the paper on which the *Counter-Proof* is to be taken.

COWSLIPS *are of four or five colours.*

1. Of a very pale *purple*. 2. Of *gridelin*. 3. Of *white* and *yellow*, &c.

1. To paint them in miniature, lay the *purple* on with *ultramarine*, carmine and white, obſerving to diminiſh the quantity of this laſt, when you are ſhading.

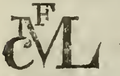
2. As for thoſe of a *gridelin* colour, paint them with a light *lake*, a very little *ultramarine*, and a great deal of *white*; ſhade with the ſame, but let it be darker.

3. For the *white ſort*, let it be white alone, and ſhade with *black* and *white* ſtrokes.

The eye of theſe three *Cowſlips* muſt be done with *maſticote*, the form of a ſtar, which is ſhaded with *gambooge*, and muſt in the midſt of it have a ſmall round of bladder green.

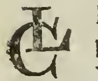
The *yellow Cowſlip* muſt be *maſticot*, ſhaded with *gambooge* and *umber*.

The buds, the leaves, and the ſtems muſt be *verditer* mix'd with a little *maſticot*, and finiſh'd with *Iris* green; with this ſame colour expreſſing ribs and veins on the leaves, heightening the lights of the largeſt with *maſticot.*



Michael Coxis his mark on certain *Arabian* ſtories in ſixty eight plates, dated in different years, one is in 1576.

C. P. ſignifies *Cornelius Pulemburgh pinxit, John Broncborts inc.*



LUKE VAN CRANOGIO, or *Luke Van Craen*, painter to the Duke of *Savoy.* His mark is ſometimes L.C. with a wing'd dragon, and the year 1509, at other times his mark is two little *Gothic* ſhields, or with the mark, or L. V. G. He engraved in wood and copper.

To make CRAYONS *or* PASTILS *of which there are different methods*, Some direct to take plaiſter of *Paris* or alabaſter calcin'd, and of the colour of which you intend to make your *Crayons* a ſufficient quantity; to grind them firſt aſunder, and then together, and with a little water to make them into paſte; then to roll them with your hand upon the grinding ſtone into long pieces like black lead pencils, and then to dry them moderately in the air; which when they are to be us'd, are to be ſcrap'd or ſhav'd to a point like a common pencil.

Thus *Crayons* may be made of what colour you pleaſe, fitting them for the faces of *men, women, landſcapes, clouds, ſun-beams, buildings and ſhadows.*

Another way. Take tobacco-pipe clay, and temper it with a little water with what colour you pleaſe, making ſeveral according to the heights of colours you would make uſe of, which mix with the ſaid tobacco-pipe clay, ſo much as the clay will bear, work all well together, form them into *Crayons*, and ſet them to dry for uſe.

The manner of laying the ground Fleſh-Colour *for a face to be wrought upon with* CRAYONS. The beſt way, ſays Mr. *Brown*, is to colour the paper that you intend to draw on with a *carnation* or fleſh-colour, near the complexion of the party you intend to draw after; and to cover the whole paper with the ſame complexion, which is made of *ceruſs, meny* and a little *yellow-oker* ground with a little *gum arabick.*

When you prepare them make a good parcel of various complexions together, it being not worth while to make one at a time.

You are to lay on this ground colour with a wet ſpunge, but let the colour be ſo bound with *gum*, that it will not ſtir from the paper by rubbing with your finger on it.

When this ground is dry, then sketch or draw the firſt rough draught with coal, that being as you would have it, draw over the ſame lines again more perfectly with red-chalk, then with your ſeveral *Crayons* you are to rub in your colours firſt, then with your fingers you are to ſweeten and mix them together, ſcumbling them one into another after the manner of the oil painters.

And becauſe many times the *Crayons* will not ſharpen to ſo good a point as *black* or *red* chalk, you muſt be extremely careful to cloſe and finiſh all your work at laſt with *red* and *black* chalk, which you may ſharpen at your pleaſure.

Hans Holben, painter to King *Henry* VIII. drew in *Crayons* the pictures of moſt of the *Engliſh* nobility both Lords and Ladies; and theſe were the patterns whereby he painted his pictures in oil.

There is another ordinary way of drawing in *Crayons* on blue paper, the ground colours are to be rubb'd in firſt with a pencil, and afterwards with a ſtubbed pencil or your finger.

And if you pleaſe you may work upon parchment exceeding neat and curious. In this manner, ſays our author, I have ſeen little pieces extremely well done by the hand of that great maſter *Hen. Goltzius* (the faces were about the bigneſs of a *Jacobus*) and alſo ſome done by the ſame hand in *Crayons*, which at a ſmall diſtance you would have taken for *limning*.

Some he drew upon the rough ſide of *velum*, and ſome on the ſmooth ſide of parchment, being rubb'd in with ſmall ſtubbed pencils, and finiſh'd with ſharp pointed *red* or *black* chalk.

His *Crayons* were about the length of a finger, and about the thickneſs of a gooſe quill.

Mr. *Brown* ſays, he has obſerv'd, that CRAYONS or dry colours are wrought in ſeveral manners or ways.

The firſt is that of *Valyant*, whoſe manner was to place ſeveral heaps of colours in powder upon white paper, of ſeveral temperatures, according to the object he drew after, whether the life or painting.

His out-lines being firſt drawn, he made uſe of ſeveral rolls of white paper, roll'd up very hard and cloſe, about the length of a pencil ſtick us'd in *limning*, and ſome of them about the thickneſs of the ſame, bigger or leſſer according as his work requir'd with which he rubb'd in the ſeveral colours. And that his work is reaſonably neat, and had a pretty good force.

And that ſome of the *French* maſters have a manner, which differs but in two things from the former.

Inſtead of the rolls of paper they make uſe of ſtubbed pencils, ſome of which are ſtuff'd with cotton, and others with bombaſt, and inſtead of placing the colours on paper, they put them into ſmall boxes.

But he rather eſteems the way of drawing with a *Crayon* about the length of a finger, compos'd of ſeveral colours and mixtures,

tures, ground together of a good conſiſtence and ſtiffneſs, and roll'd up and dried.

That though they us'd formerly to temper them with milk, beer or ale, and ſome have anciently made uſe of ſtale ſize to bind the colours together, yet he approves not of any of theſe; for either they bind the colours ſo hard that you cannot draw at all with them, or elſe they are ſo brittle or looſe that you cannot ſharpen them to a point.

Another way. Grind your colours very fine upon a marble, ſift them through a tiffany ſieve; then take a piece of tobacco-pipe clay, and lay it on the grinding-ſtone, and temper it and your colours together with ſtrong ale-wort.

Great care muſt be taken not to make them too wet, but of an even temper like moiſt clay, ſo that you may roll them up with your hand upon a ſtone.

Then lay them on a piece of paper, and ſet them to dry in an oven after the bread has been drawn out, or elſe you may dry them on a fire-ſhovel by degrees, till they are of a due hardneſs, which you may know by trying them on a piece of paper; and if they caſt, they are not dry enough, and if ſo you muſt dry them longer, till they will not caſt; then take a feather and ſome ſallet oil, and oil them lightly over, and then lay them by to dry again; till they have thoroughly imbib'd the oil, which will render them excellent, and work free and eaſy.

Mr. *Brown* tells us, that he has taken yellow-oker burnt, and roll'd it up into a *Crayon*, and dried it with a moderate heat, and when it was thoroughly dry, he made it very warm, and then dipp'd it into linſeed oil, and being thoroughly ſoak'd, he drew with it, and rubbing it with his finger, it would not rub out, nor any part of it ſtir, and he believes all the reſt of the colours may be made to have the ſame quality; and adds, he doubts not but the *German* maſters and others of the low *Dutch* had that art, he having by him drawings in *Crayons* of *Goltzius* and others, which were extremely neat, and would not rub out, being ſtrong and like oil painting.

He recommends the following as the beſt manner of making *Crayons.*

Firſt temper as many *Crayons* as there are varieties and changes of colourings in fleſh, or faces, or draperies, or landſcapes, *&c.* making them deeper or lighter as you pleaſe, as

If you were to make a *Crayon* for a brown glowing complexion, grind upon your ſtone *ceruſs* and *vermilion*, *Engliſh* oker and a little *pink*, you need not be over curious to grind them extremely fine, but reaſonably to bruiſe and mix them well together; to this add a proportionable quantity of *plaiſter* of *Paris* burnt, and finely ſifted through a fine tiffany ſive; then mix that and incorporate it with all the colours indifferently thick and ſtiff like moiſt clay; and then take it from the ſtone and roll it up in a lump, out of which lump you may make your *Crayons*, by rolling with the palm of your hand upon the ſtone a ſmall quantity of it, as much as will make a *Crayon* the length of a finger, and about the thickneſs of a gooſe quill; then lay it in the ſun to dry or the wind, but not by the fire.

In this manner, and with this mixture of *plaiſter* of *Paris*, with all the other colours and ſhadows in general, you will make them of a gentle quality and bind the colours together, and make them hold a ſharpening to a fine point which otherwiſe would be too looſe and brittle. The colour moſt difficult to work in this kind is *crimſon*, if you make uſe of *lake*, which you may avoid and make uſe of *roſſet*.

Another way to make a *crimſon Crayon* to prevent it from being brittle or hard, you may temper it with a lighter mixture, which will make it more ſoft and gentle.

Be ſure to mix *ceruſs* with all the other colours and ſhadows whatever.

The temperatures for *greens* are made of *pink* and *bice*, and *maſticot* and *ſmalt*, and *maſticot* and *indigo*, with which colours you may make them lighter or deeper as you pleaſe, remembring that where you are to temper firm colours, as *umber*, *oker*, *indigo*, &c. you are to take the leſs *plaiſter* of *Paris*; and where the colours are looſe there bind them ſtronger and faſter, by adding more *plaiſter* of *Paris*.

Of the making of CRAYONS *for dry colouring.*

The uſe of *Crayons* for dry colours is ſo neceſſary in taking of views and proſpects, and there are ſo few *Crayons* that are good of the ſort, that I think the way of making them a neceſſary article to be known to every one, who is a lover of drawing and painting.

WHITE.

As for *white* we have no occaſion of any other, than that of *white* ſoft chalk, which ſhould be ſaw'd into lengths of an inch and half or two inches, [There are little ſaws made on purpoſe for ſuch uſes about four inches long and very thin.] When you have ſawed out your *Crayons* of chalk, which ſhould be at moſt a quarter of an inch thick, round off the corners with a penknife, and point them by drawing your penknife upwards from the place where the point is to be. You ought to have a dozen or two of theſe to lie in a little caſe by themſelves, or they will be diſcolour'd by the other colours.

YELLOW PASTILS, *or* CRAYONS.

Yellows come next, which ſhould be divided into four or five degrees of colour.

1ſt Yellow. Take ſome grounds of ſtarch and flower of brimſtone, mix them well with a knife upon a poliſh'd marble, ſo that they produce the colour of ſtraw, or a *Yellow* as will ſhew itſelf faintly; then pour a little milk to them, or a little pale ale-wort, till the colour become like a paſte; then ſpread the paſte on a ſmooth piece of chalk, with a broad knife till it is about the third part of an inch thick, and let it lye till 'tis half dry; then with a ſharp knife cut it in lengths of an inch and a half, about the fourth part of an inch wide, and roll it thin between two little pieces of board, till they are round like a ſtraw, and point them as I have directed for the chalk. If you pleaſe you may uſe ground chalk inſtead of grounds of ſtarch.

2d Yellow. It is made of yellow oker, ground well with fair water, and then dried and beat. Mix this with ground chalk, in ſuch quantity as it will be a little deeper than the former colour, and mix them up with pale ale-wort, in which a little white ſugar-candy may be diſſolv'd; and make theſe *Crayons* as the former.

3*d Yellow.* Grind yellow oker with water, with a ſtone and muller, and when 'tis dry, beat it very fine, and make it into *Paſtils* or *Crayons*, with pale ale-wort, or ſize made with glover's leather, boil'd in water 'till it comes to a jelly; uſe it as before directed, and roll the *Paſtils* between two boards.

4*th Yellow.* Take *Engliſh* pink, grind it as the former with water, and when 'tis dry beat it fine, and mix it with a very little ground chalk, till 'tis deeper than the former colour; then put to it ſome wort of pale ale, and ſtir all well together, and make it into *Paſtils* or *Crayons*, by rolling in the foregoing manner.

5*th Yellow.* *Engliſh* pink is to be ground as the former, and to be made in *Paſtils* or *Crayons*, by itſelf with pale ale-wort.

6*th Yellow.* *Dutch* pink is to be us'd as the former, and mixt with pale ale-wort, or milk, and to be roll'd and dried.

7*th Yellow.* Orpiment is one of the moſt poiſonous colours that can be us'd; however it is one of the moſt beautiful ſort, and is next to orange-colour. This muſt have a little ground chalk mixt with it, well temper'd together, and made up with pale ale-wort, with a little gum-dragon diſſolv'd in it; and roll them up into *Paſtils*, as you did the former.

ORANGE-COLOURS.

1ſt Orange-Colour. Take yellow orpiment, mixt it with pale ale-wort, and when it is in paſte, roll it, and make it into *Paſtils* or *Crayons.*

2. *Orange-Colour.* Take orpiment and red-lead, (let the red-lead be very finely ground in water, and dried) then mix a little of this with your orpiment, till you have the colour you deſire; and putting in it ſome ale-wort, wherein ſome gum dragon has been diſſolv'd, make into a paſte, and roll it into *Paſtils* or *Crayons*.

3*d.* *Orange-Colour.* Take *Engliſh* pink, grind it well, and put to it as much vermilion as will make it of the colour you deſire; mix theſe up with ale-wort, that has been boil'd till 'tis more glutinous than ordinary, and make it into *Paſtils* or *Crayons* as before.

4*th* *Orange-Colour.* Take *Engliſh* pink finely ground, and put to it as much red-lead, well ground, as will make it agreeable to your deſign, mix theſe well with ale-wort boil'd to a thickneſs, and make them into *Crayons*.

5*th* *Orange-Colour.* Take ſome *Dutch* pink, well ground, and mix it with ſome red-lead finely powdered, to the colour you want; then with ale-wort or milk make it into a paſte, and make it into *Paſtils* as before.

Note, In the mixture of theſe colours, obſerve, that they have as many different ſhades as poſſible.

REDS.

1*ſt* *Red.* Take red-lead, grind it well with water, then dry it and beat it to a fine powder, and put to it ſome chalk or white-lead finely ground to brighten it; mix this with ale-wort, wherein a little gum-dragon has been boil'd, make it into a paſte, and roll it into *Crayons*. Of this your *Paſtils* ſhould be made ſome deeper, others paler.

2*d* *Red.* Take red-lead, and grind it well with a marble and muller, make it into a paſte with ale-wort, in which gum-dragon has been boil'd.

3*d* *Red.* Red-oker wants no preparation, but ſawing as directed for chalk, in the firſt article.

4*th* *Red.* Take vermilion, ground fine, and mix it with ſome fine chalk, or white-lead, well pulveriz'd; divide the compoſition into three parts, and by adding more of the white to one than another, you may make three different colours; then put ale-wort boil'd thick to each, and make them ſeverally into paſte, and then into *Paſtils*.

5*th* *Red.* Take vermilion, grind it well, and mix it with ale-wort, that has been boil'd to a thickneſs with gum-dragon, till it is a paſte, then roll it into *Crayons* or *Paſtils*.

6*th* *Red.* Take ſome good lake, well ground with water upon a marble, and when 'tis well dried and powdered, divide it into three parcels, and mix with each as much chalk or white-lead ground fine, as will make them of different colours, work them ſeverally into paſte; then roll them into *Paſtils* or *Crayons.*

7th Red. Take fine lake, and reduce it to as fine a powder as you can with water, and when 'tis dry, and again finely powdered, mix it with ale-wort, and make it into a paſte, and roll it into *Crayons.*

8th Red. Take *Indian* red well ground with water, and dry it like the other colours; then mix it with ale-wort that has been boil'd to a thickneſs with gum-dragon. This alone will be a very ſtrong colour; but to make it of different ſhades, you muſt mix it with white, each parcel ſo as to be ſhades to one another; then make 'em ſeverally into *Paſtils.*

9th Red. Take roſe-pink, and cut it into the ſhape of *Crayons*, without any preparation. Carmine is too dear for them; for twelve penny-worth would make but a ſmall *Crayon.*

PURPLES.

1ſt Purple. Take roſe-pink finely ground and powdered, mix it well with a little *Sanders* blue, till the powder appears of the colour you deſire; then make it into a paſte with ale-wort, thickned with gum-dragon, and roll it into *Crayons.*

2d Purple. Take lake finely ground and waſh'd, add to it as much blue bice as you think convenient to make it of a reddiſh purple, and you ſhould vary this in two or three manners, each lighter than the other; in the lighter ſorts, put a ſufficient quantity of chalk or white-lead ground fine, and mix them up with ale-wort boil'd to a thickneſs with gum-dragon; then roll them into paſtils.

3d Purple. Take ſome lake well ground, and to it add as much *Pruſſian* blue as will make it of the colour you intend; mix thoſe well together in different parcels, making ſome more inclining to red than the others; and to make the fainteſt purple of them, add ſome chalk ground at your diſcretion, and make 'em ſeverally into paſte with ale-wort thickned by boiling; then into *Paſtils* as before directed.

BLUES.

1ſt Blue. Blue bice is the lighteſt blue colour uſed, and muſt be well ground with fair water on a fine marble, and when it is dry, reduce it again to a powder; then lay it in four parcels, and put to three of them, in different proportions, ſome chalk or white-lead ground, ſo that, when mixt, each may be lighter than the other; mix theſe ſeparately with ale-wort, thickened with ſcraps of glover's leather; and when they are made in a paſte to your mind, make them into paſtils, and the fourth part of the blue bice muſt be made up by it ſelf in the ſame manner.

2d Blue. Take verditer well ground on a fine marble, lay it in four parcels, and mix one of them purely with a thin ſize, made of white glovers ſhreds and ale-wort; and the other three parts mix with ſeveral proportions of chalk or white-lead well ground, ſo as to make ſhades to one another; make theſe into paſte with ale-wort, thickned with gum-dragon, and then into *Crayons.*

3d Blue. Take ſome *Pruſſian* blue well ground, and lay it in four parcels on your marble, and with three of them mix ſome chalk or white-lead well ground to make them of different degrees of colour, and the fourth muſt be alone. Make the three mixt colours into paſte with pale ale-wort boil'd till it thickens; and the plain colour muſt be made into a paſte with ſome ale-wort boil'd, and thicken'd with white ſhavings of leather from the glovers. Make all theſe into *Paſtils.*

4th Blue. Take rock indigo well ground with water on a marble, dry it and powder it again; then divide it into parcels as before, and with two or three parts of them, mix different proportions of ground-chalk or white-lead ground, to make them deeper or paler; and one part muſt be the ſimple colour. Put to the mixt colours ſome ale-wort thickened with boiling, and mix them to paſtes; then make them into paſtils.

As for the plain indigo, mix it with ale-wort thickened by boiling with glover's ſhreds of white leather, then make it into *Crayons.*

BLACKS.

1ſt Black. The black that is commonly uſed as a *Crayon*, is charcoal cut into lengths; the ſofteſt and beſt is that made of willow. Have at leaſt a dozen or two of theſe, for black and white are a great deal more uſed than any other colour.

2d Black. Take ivory black ground very fine with common water, add to it a very little ground indigo; for a bluiſh caſt will enliven the black, and help that deadneſs, which a plain black always carries with it.

BROWNS.

1ſt Brown. Take for a light brown ſome fuller's earth, grind it well with water, and mix with it ſome ground chalk or white lead, to make it in different colours, that is lighter or darker, as you think proper; mix this up with pale ale-wort boil'd thick, and have at leaſt four ſorts of it.

2d Brown. Take ſome *Spaniſh* brown ground very well, and mix with it ſome fuller's-earth, to make it lighter, for the *Spaniſh* brown is a dark colour of itſelf; and when you have made this mixture, you may put to ſome part of it a little chalk or white-lead ground in different proportions, to have them of different ſhades: Theſe are for the lighter browns, and mix them ſeverally in paſtes with a light ſize of fiſh glue, or iſinglaſs and water, and ſome of them with pale ale-wort boil'd thin, or thick water-gruel boil'd with gum-dragon; then make them into *Crayons.*

3d Brown. Take *Spaniſh* brown ground fine, and ſome *Indian* red; mix them well together, and to them put ſome pale ale-wort, till they become a paſte. You may make ſome of them lighter with chalk, or white-lead ground; then roll them into *Paſtils.*

GREENS.

1ſt Green. Take ſome verdegreaſe, and boil it in ſharp vinegar, and when it boils, add a little tartar powdered, which will ſo diſſolve the verdegreaſe, that the liquor will be of a fine colour; then ſet the liquor in little gallipots expos'd to the air, which will dry the colour, and then it will diſſolve in common water. This may be taken with as much warm ale-wort as will cover it, and will diſſolve the green; then make it into *Paſtils*, with ground white chalk, as much as you think fit.

2d Green. Take diſtill'd verdegreaſe ground with vinegar on a marble, waſh it well with water; the manner of which is, to throw the verdegreaſe into water, and in half a minute to pour off the water into a cup, and let it ſettle; then pour the water from it, and waſh it again in the ſame way; and when this is dry, make it into *Paſtils* with ale-wort.

3d Green Take verdegreaſe prepar'd as before, finely powdered, and mix it with a little *Pruſſian* blue in ſeveral proportions. In the lighteſt ſorts, put a little white, or the brighteſt yellow well ground, to make varieties of colour; mix all theſe with pale ale-wort boil'd to a thickneſs.

4th Green. Take *Indigo* well ground, and ſome *Engliſh* pink; mix theſe well together upon a marble, and when they are well powdered, make them into a paſte, and roll them up with a ſoft ſize and oil into the ſhape of crayons, or with pale ale-wort or thick water-gruel; but when you uſe water-gruel, it muſt be ſtrain'd and boil'd with ſome gum-dragon.

5th Green. Take blue bice ground fine, add to it ſome *Dutch* pink well ground; mix them in parcels, and prepare them in ſhades to one another; then make them into paſtes, and roll them into *Paſtils.* You may have five or ſix ſorts of theſe.

Note, The liquid you uſe to make them into *Paſtils*, muſt be ale-wort boil'd a little thick.

6th Green. Take rock indigo ground very fine with water on a marble, and when 'tis dry, beat it fine again; then divide it into parcels on the marble, and to ſome of them put a little flower of brimſtone in greater or leſſer quantities; to others flower of brimſtone and *Dutch* pink mixt, ſo that you may have variety of colours. When you have thus made the different ſhades you intend, then make them into paſtes with ale-wort thickened by boiling with white glover's ſhreds of leather, or a little gum-dragon; and roll them into *Crayons.*

7th Green. Grind rock indigo with water, and put to it in ſeveral parcels, as much *Dutch* pink as you think fit, to make your greens of various ſhades; when theſe are well mixt, put to them ſome ale-wort thickened by boiling, with which make them into paſtes; then roll them into *Paſtils.*

Note, The reaſon why theſe *Paſtils* are better than thoſe in common which are bought at ſhops, is becauſe they are generally made too ſtiff with gums, and ſo will hardly touch the paper; and all theſe will work freely, and expreſs the ſeveral colours you deſire.

The reaſon why you are to make five or ſix ſhades of each colour is, becauſe we cannot mix any when we uſe them; whereas in oil-painting, and painting in water-colours, we can make what mixtures we pleaſe in an inſtant: And when we are about any painting or drawing in *Crayons,* which happens to have a great variety of colours in it, we ought to have every ſort of colour that can be thought on.

Note, Theſe colours ſhould be kept in a box partition'd, every ſort by it ſelf, *viz.*

The *White.*

Yellows. Lay the brighteſt ſorts in one, and the deeper ſorts in another, till you come to the orange-colours.

Orange-Colours. The lighter ſorts in one apartment, and the deeper in another.

Reds. The paler ſorts, or fleſh colours, in one apartment, the brighter reds in another, the ſtronger reds in another, and the deepeſt reds in another; every one with its proper ſhades, till we come towards purple.

Purples. The paler ſorts inclining to red in one apartment; the next ſorts, more inclining to blue, in another, with their ſhades; and thoſe which are next to blue with their ſhades, in a part by themſelves.

Blues ſhould follow the purples; put the lighteſt in the firſt apartment, the next degree into another, a third into another, and the fourth to the laſt into others: But the *Pruſſian* blue keep quite by itſelf, and its mixtures by themſelves; it ſerves very well in this way to ſupply the place of ultramarine, and it is much cheaper, for a *Crayon* made of ultramarine would coſt not leſs than half a guinea. And beſides in this way of *Crayon*-drawing, the preparation of *Pruſſian* blue does very well anſwer the ſame end, though that colour will not do in water-colours, nor even laſt in oil-colours, if it comes to be expoſed to the weather, for in either caſe it changes to a dirty yellow-colour; but I find the *Crayons* hold, by being imbodied as I have directed.

Greens ſhould be divided into three or four ſorts, and, with their ſhades, be laid in ſeveral apartments.

Browns ſhould alſo be put in three or four parcels, with their proper ſhades, to be laid in each apartment of one great box. And you ſhould never be without *Crayons* of charcoal in another caſe.

With all theſe you will be compleately furniſhed; and when you go out to take any view, have one of every ſort in a little box, divided as the foregoing, to carry in your pocket.

The Paper which you ſhould uſe on this occaſion, ſhould be *Venice* rough paper, almoſt like our whited brown paper, or even the whited brown paper ſold at every chandler's ſhop; the ſtiffer it is, the better; that which they call cap-paper is the beſt, as you will find by exprerience, for upon ſuch the colours eaſily diſtribute themſelves. And by this means you may take figures in their proper colours as you ſee them, for you may match the colours as they appear with the *Crayons* you have by you; and, as the *Crayons* are dry, they will not alter their colour, whereas the wetted colours will appear deeper when they are wet, than when they are dry, which will deceive the eye of a young beginner.

Inſtructions for the uſe of CRAYONS.

Remember when you uſe theſe *Crayons*, that you point them from the bottom upwards, and make not the points too ſharp, except in the white chalk, the red oker, and the charcoal.

You may make a pretty drawing on blue paper, with only chalk and charcoal; the ſtrong lights and the dark ſhades make a fine contraſt, and a pleaſant appearance in a drawing.

CREDIT is repreſented in painting, *&c.* by one at man's eſtate, nobly clothed, having a gold chain about his neck, with a merchant's book of accounts indorſed on the cover, *Solutus omni fœnore*, free from all intereſt, and a griffin below.

His age ſhews that he may have credit, as does his ſenator's gown; the gold chain ſeems to command credit; the motto ſignifies true credit; the griffin was in great credit amongſt the antients, and uſed for a ſymbol of ſafe cuſtody, and therefore intimates, that a perſon ſhould have a watchful eye over his ſtock, if he means to get credit.

To dye cloth, ſtuff, &c. *a braſile* CRIMSON. Firſt dye it as you do fleſh colour, but it muſt be deepened, then pour into the copper freſh ſpring water, adding lye of pot-aſhes, and lye made with calcin'd *tartar*; ſtir them well together, and let the cloth ſoak in it two hours, ſtirring it about every quarter of an hour, and it will be of a very good *Crimſon*; but if the cloth doth not take the dye kindly you muſt add more of the lye.

To dye a very good CRIMSON. Allow half an ounce of *cochineal* to every pound of wool, half a quartern of *oatmeal* or *wheaten-bran*, having firſt diſſolv'd it eight days in water, that it may become ſour,. and when you go about dying, pour the bran-water into the kettle, and then (the *cochineal* having been diſſolv'd the night before in warm water) make a good fire under the kettle to heat the liquor, and put it into it by little and little, till there is no more of the ſolution left, ſtirring it about all the while; and when it begins to boil, add a proportional quantity of lye, and paſs the cloth through it three times; or throw half a quartern of wine lees or aſhes into the warm ſuds, and paſs the goods through it till they have taken the dye ſufficiently.

Another CRIMSON. Let the ſtuffs be allum'd as uſual, and having heated a ſufficient quantity of fair water, and for every pound of ſtuff or wool, take of *cochineal* and *tartar*, each an ounce and half, the former being, as before, firſt ſufficiently diſſolv'd, boil theſe together; put in the goods that you would dye, and keep ſtirring them about for an hour and a half, then cool and rinſe them out.

An extraordinary good CRIMSON. Take two ounces of fine white wine *tartar*, beaten very fine, and two ounces of the beſt alum for every pound of woollen ware, and alſo half a pail full of clean rain water for each pound, boil them together with the ware for an hour, ſtir it about and then hang it out; let it dry and rinſe it very well in clean water.

Then heat clean rain water in a copper, take out a pailful, and put into it one ounce of *cochineal*, pounded to an impalpable powder, diſſolve it a little and pour it into the kettle again, taking care to rinſe the *cochineal* very well out of the pail; then having reduc'd one ounce and a half of *tartar*, and a dram of *red arſenick* alſo into powder, ſtir them well together and put them into the copper; then put in the ſtuffs after them, and a quarter of an hour after, add two ladles full of *wheaten-bran*, keeping ſtirring them continually; boil them for a quarter of an hour; then take out the ſtuffs and rinſe them.

But you muſt take notice, that when you put in bran, you muſt alſo put in a ſpoonful of burnt wine lees, which will give the ſtuffs an extraordinary luſtre.

A purple CRIMSON. Firſt dye the ware a light blue, ſtill remembring that the lighter the blue is, the finer the purple will be.

Then with an ounce and half of *cochineal*, and an ounce and half of *tartar*, work it as other *Crimſon*, and it will be a very beautiful colour; and the luſtre will become remarkably brighter and clearer by adding a little bran-dye.

A lavender CRIMSON. Having firſt dyed the ſtuff of a tawny faint blue, rinſe it clean, and throw the ſuds into the purple ſuds, after they have been us'd in dying.

Theſe ſuds being of very little value, and otherwiſe uſeleſs, produce a good lavender dye at a cheap rate. See LAVENDER.

For a CRIMSON colour in painting uſe *carmine*, but it is neceſſary that the buyer be inform'd, that there are ſeveral ſorts of it, ſome darker and ſome much coarſer than others, and therefore it ſhould never be bought by candle light, unleſs of ſuch in whom one can confide; for between the beſt and the worſt there is ten ſhillings an ounce difference; nay, indeed all the money an ounce will coſt, becauſe that which is bad will ſpoil the work.

Of a tranſparent CRIMSON. A liquid colour not much inferior to carmine itſelf, may be made of the raſpings of braſile wood, ſold at the dry-ſalters, and at ſome colour ſhops.

To make this tranſparent *Crimſon* colour, boil an ounce of the raſpings of braſile wood in twelve ounces of pale ſtale beer and a little allum, till the colour of the liquor is as ſtrong as you pleaſe; which you may diſcover by dipping into it a ſlip of white paper, and when this colour is as you would have it, and 'tis cold, paſs it through a linen cloth, and put the clear liquor into a bottle for uſe.

And if you have a mind to bring this colour to a body, take ox blood and dry it, till it can be reduc'd to a powder, which being mixt with it will give a colour, which will not be much inferior to a middling ſort of *carmine*. Some ſay, that the blood of an ox or cow dry'd, will make a good body for any colour.

A CRIMSON *colour from Mr.* Boyle. Take the fruit of the berry bearing *ſpinach*, which every gardiner about *London* knows, preſs them, and you will have a beautiful red-colour'd juice from them; boil this and put about a fourth part of allum to it, when you pour it into the veſſel where it is to cool, and it will make as fine a colour as any others that are noted, and for a ſmall expence; for it will grow any where, and in one bunch of the fruit, there are ſeeds enough to ſow two or three roods of ground.

The red *beet-root* bak'd with a little ſtrong vinegar produces an elegant red colour, equal to a tincture of carmine, then pour it on allum, and it is fit for uſe, where carmine ſhould be us'd in waſhing of prints: For it is a fine tranſparent red.

A CRIMSON *colour for waſhing prints*, &c. Put thirty or forty grains of cochineal bruis'd into a gally-pot, and as many drops of *tartar-lye* [ſee it under the articles *tartar* or *lye*] as will juſt wet it, and make it give forth its colour; and immediately add to it half a ſpoonful of water, or more if the colour be yet too deep, and you will have a delicate purple liquor or tincture.

Then take a bit of allum, and with a knife ſcrape very finely a very little of it into the tincture, and this will take away the *purple* colour, and make it a delicate *Crimſon.*

Strain this through a fine cloth into a clean gally-pot, and uſe it as ſoon as you can, for this is a colour that always looks moſt noble, when ſoon made uſe of, but will decay if it ſtand long.

To dye a common or ſlight CRIMSON. For one pound of woollen, take 2 ounces of *allum*, 2 ounces of *white wine tartar*, one ounce of *aqua fortis* temper'd with half an ounce of *Engliſh tin*, a pound of *madder*, a quarter of a pound of *blue* wood. Boil the ſtuffs well in this liquor, then let them cool and rinſe them out.

To finiſh the dye. Put into the liquor a quarter of a pound of blue wood, three ounces of pot-aſhes, and ſtir the ſtuffs very briskly in it. This dye looks very well and may ſerve for ſlight ſtuffs, and ſuch as are deſign'd for linings, and that are kept from ſweat, wet and weather; but it quickly fades.

To dye a very fine CRIMSON. For ſixteen pound of woollen ſtuffs, boil twelve gallons of water or rather more, to which put in ſixteen handfuls of wheaten-bran; let it ſtand a night to ſettle, ſtirring it very well, and in the morning pour off the clear liquor or rather ſtrain it, that it may be perfectly clear.

Mix one half of this liquor with as much clean water, that the ſtuffs or wool may be work'd commodiouſly in it.

Boil this mixt liquor and put into it one pound of *allum*, and half a pound of *tartar*; firſt boil theſe very well, and then put in the goods, and boil them for two hours, keeping them ſtirring (eſpecially if they be wool) from top to bottom continually.

To finiſh it. Boil the remainder of the bran and water, with an equal quantity or rather more fair water, and when it boils apace, put in four ounces of *cochineal*, and two ounces of pure white wine *tartar* powder'd; ſtirring it about, and taking care that it neither runs over or boils too faſt, and when it is very well boil'd, put in your ware, and ſtir it about till you find that it has taken the dye equally every where, then cool and rinſe it out.

To dye a natural or lively CRIMSON. Firſt wet the goods well, and for every pound of ſtuff to make the ſuds, uſe two ounces and a half of temper'd *aqua fortis*, and three ounces and half of *tartar*, an ounce and a half of *cochineal*, and eight ounces of *allum*; boil the ware with all theſe for half an hour, let them cool and rinſe them out.

To finiſh the dye. Boil four ounces of *cochineal*, three ounces of ſtarch, three ounces of *white wine tartar*, and half an ounce of white *arſenick* together for a quarter of an hour; then put in the goods, and let them boil for above half an hour, or till they have taken the dye well and equally.

To dye SILK *of a* CRIMSON. The ſilk having been prepar'd as before directed, allow an ounce and half of *cochineal* to every pound of ſilk, pound it to powder, and paſs it through a hair ſieve, then put it into the remaining pail of liquor laſt mentioned, hang it over the fire again; then with the liquor put it into a braſs kettle, and cover it very cloſe that no duſt may get in, and hang it over the fire again, and add to it an ounce and a half of white *arſenick*, and two ounces and a half of tartar, both reduc'd to a fine powder; boil them together for a quarter of an hour; then take it off the fire, and let it ſtand a very little while, and then put in the ſilk, ſtirring it about very well, that the colour may not be variegated when the liquor is cold; then wring out the ſilk, and if it is not ting'd enough, hang the dye over the fire again, and after the *ſilk* has been beaten, put it in again as before.

When the *ſilk* is dyed, you muſt in the firſt place rinſe it out in hot ſuds, made by putting half a pound of *Venice ſoap*, in proportion to every pound of ſilk, let it be diſſolv'd in it, and afterwards put the ſilk into cold river water; then beat it upon a block and hang it to dry, then ſpread it abroad, wound and manag'd according to cuſtom, it will be a very beautiful *Crimſon*.

If you would dye *Crimſon* from a violet ground, you may always abate one third part of the quantity of the ingredients; that is a pound of ſilk ſo grounded will not require above an ounce of *cochineal*, as much of *arſenick*, and two ounces of tartar.

Another cochineal CRIMSON *dye*. When the ſilk has been well boil'd and prepar'd as before directed, take half a pound of crude allum to every pound of raw *ſilk*, and when it is diſſolv'd, put the ſilk into the liquor, and let it ſteep for the ſpace of a night; the next morning rinſe it out very well; and then dye it as follows.

Into a kettle of fair water put in two ounces and a half of *cochineal* finely powdered for every pound of ſilk, and three ounces of pounded galls, and three ounces of purified gum, one eighth part of an ounce of *turmerick*, and in this liquor boil the ſilk for two hours; after which, let it remain in it a whole night, and the next morning rinſe it and dry it.

To dye SILK *a dove* CRIMSON. The ſilk having been allumed, (as above directed) clean rinſed, and hung upon poles, take a kettle, ſcour it very clean, fill it with water, and to each pound of ſilk, put an ounce of *cochineal*, ſtir the ſilk in the liquor, and boil them for an hour, then rinſe the ſilk out, wring it and dry it.

You muſt take ſpecial care that the ſilk is not party-colour'd or of different colours, by taking the colours better in one place than in another; and for that reaſon, it muſt be put in when the liquor is no more than lukewarm.

A ſlighter ſort of dove CRIMSON. To every pound of ſilk take four ounces of *braſile*, boil and ſtrain it as before, then pour cold water to it, till it becomes juſt lukewarm, then ſtir the ſilk in it, till it has extracted the ſtrength out of the dye or liquor, which you may then throw away; and again, put *French* water, and then a little pot-aſhes to it, thus let it diſſolve, ſtir the ſilk in it, rinſe and dry it.

To dye a CRIMSON *with* ORSEILLE. Fill a clean kettle with fair water, and allow three quarters of a pound of *Orſeille* to every pound of ſilk, ſtir the ſilk about in it and wring it out; then add a quarter of a pound of *allum*, and a handful of white *arſenick* to every pound of ſilk.

Let the ſilk lie in this liquor a whole night, the next morning wring it out carefully and dry it, afterwards take two ounces of *cochineal*, two ounces of galls, and two ounces of *gums*, and a little *turmerick* to every pound of ſilk; put in the ſilk and boil it for two hours; then put in a little *Zepſic*, let the ſilk lie in it all night, and the next morning rinſe it and dry it according to art.

To dye Silk a CRIMSON *Musk colour*. Fill a clean kettle half full of water, and for every pound of ſilk, take a quarter of a pound of *yellow wood*; tye it up in a bag, put it into the kettle, and boil it very well; add to every pound of ſilk one ounce of *blue wood*, and boil them together; then put in one pound of galls, and fill up the kettle with ſtale gall water; then put in the ſilk, being firſt allumed and cleanſed; ſtir it about very well, and let it lie in the dye all night, the next morning wring it out, rinſe it and beat it, and then rinſe it again in warm water and *ſcheiet*; and when you find the dye deep enough, cool it, wring it out, rinſe it, beat it and hang it up to dry.

To dye SILK *an* ORANGE CRIMSON. Put clean rain water into a very clean kettle, then put four ounces of pot-aſhes, and four ounces of *orleans*, ſtrain them through a ſieve into the kettle, and diſſolve them very well, then the boil'd and allumed ſilk (being firſt well rins'd from the allum) muſt be ſtirr'd about in it and boil'd, then wrung out and rins'd and beaten; then to every pound of ſilk, take twelve ounces of galls, which boil two hours, and then let them cool for two hours, and afterwards lay the ſilk to ſoak in it for three or four hours; after which take it out, wring, rinſe, beat and dry it.

To dye SILK *an Iſabella* CRIMSON. Prepare the ſilk, rinſe and beat it very well, then ſtir it about in the ſame liquor in which the orange colour is dyed, and ſo you will have a fine *Iſabella Crimſon.*

Then rinſe, wring and beat it well, and lay it in the gall ſuds, which the *orange* has before been in for three or four hours; and afterwards rinſe and dry it very well.

If you have no *orange ſuds*, take for every pound of ſilk one ounce of *orleans*, half an ounce of pot-aſhes, and dye it therein like the *orange*, then gall it, rinſe and dry it.

The CROCUS *Flower* is of two colours, the *yellow* and the *blue* or *purple.*

For the *yellow Crocus* [in miniature] take *maſticote* and *gall-ſtone*, ſhaded with *gambooge* and *gall-ſtone*, expreſſing three lines or rays on the outſide of the leaf, ſeparate from, and parallel to each other, with *biſtre* and pure *lake*, which muſt be ſcumbled into the ſtrokes of the ground or leaf; and the inſides of the leaves muſt be all *yellow.*

For the *purple Crocus*, lay on *carmine*, mix'd with a little *ultramarine* and *white*, expreſſing deep purple ſtripes on ſome of the leaves, as you did for the *yellow*, and on others only fine veins.

The ſeed of both ſorts is *yellow*, and muſt be done with *orpiment* and *gall-ſtone*; for the ſtalk, lay on *white*, and ſhade with *black*, mix'd with a little *green.*

The green of this flower is a pale *verditer*, ſhaded with bladder *green.*

CROCUS MARTIS } for colouring of glaſs. Of this there
CROCUS FERRI } are ſeveral ways of preparing, ſome more ſimple, and others more extraordinary and curious, both with and without liquors or *menſtruums*; the effects of which are different both in tinging of glaſs and other uſes to which it is put.

CROCUS MARTIS, made without *menſtruums*, depends on a very fine calcination of the *iron*, by means of which, the tincture that is extracted gives a very fine red to glaſs, and ſo communicates it ſelf to it, that it not only manifeſts it ſelf, but makes all other metalline colours (which ordinarily are hidden and dead in glaſs) appear fair and reſplendent.

As to the way of *menſtruums*, it may be ſaid, that all acid and corroſive juices which operate on *copper*, will alſo do the ſame on *iron*; ſo that you will always have a red colour, more or leſs bright, and which may be mixt with tinctures of other metals to make other different colours.

The firſt way of making *Crocus Martis* is as follows. Take very fine filings of iron, or thoſe of ſteel which are better, mix them in a crucible, with three parts of powdered brimſtome, laid layer upon layer; calcine them for four hours by a very ſtrong fire, till the ſulphur is conſum'd; then take the crucible out of the fire, and let the matter cool; then grind it to a very fine powder, and ſearce it through a very fine ſieve; then put that powder into a crucible, and lute it well, and ſet it into the mouth of a reverberatory furnace for the ſpace of fifteen days or more; and of the reddiſh colour it was before, it will become a very deep red, almoſt like a purple. Keep it in a very cloſe veſſel for the uſe of glaſs colours; it will work many wonderful effects.

Another way of making CROCUS MARTIS *for colouring of glaſs.* Though this way of making *Crocus Martis* be very eaſy, yet it deſerves to be eſteem'd, ſince it tinges glaſs of the true blood red colour. It is prepar'd as follows.

Take filings of *iron*, or (which is better) *ſteel*, put them into earthen pans with ſtrong vinegar; mix them well, but only ſprinkling them ſo much, that they may be thoroughly wet; ſpread them abroad in the pans, and ſet them in the ſun to dry, or if the ſun be obſcur'd by clouds, ſet them in the open air; then powder them, and ſprinkle them again with vinegar, and dry them again as before; then powder them again, repeating this operation eight times; at the laſt, grind and ſearce them well, and you will have a very fine powder of the colour of beaten brick, which keep in cloſe veſſels for uſe.

This *Crocus Martis* thus made with vinegar, complies very much with *greens* and the *emerald* colour of glaſs of lead. It is us'd alſo in paſtes for the ſame colour with *verdegreaſe*, and in blacks.

Another CROCUS MARTIS *with* aqua fortis. Put fine filings of iron or ſteel into well glaz'd earthen pans, ſprinkle them with *aqua fortis*, and ſet them to dry in the ſun, and then reduce them again into powder, and repeat this proceſs ſeveral times, as in that made with vinegar; and when it has obtain'd a good red colour as before, powder it, ſearce, and keep it in a glaſs veſſel cloſe ſtopp'd for uſe.

By this the red colour of iron is made more manifeſt in glaſs, and is ſo very reſplendent and bright, that it ſeems almoſt incredible, but that experience has ſhewn it.

A CROCUS MARTIS *with* aqua regalis. Diſſolve filings of *iron* or *ſteel* in a glaſs body well covered in *aqua regalis*, that is, in *aqua fortis* made *aqua regalis* with *ſal armoniac*. See *aqua regalis.*

Keep them ſo for three days, ſtirring them every day well, during which you may add freſh filings by little and little; in doing which you muſt be very cautious, for it riſeth ſo much by fermentation in the *aqua regalis*, that it will endanger the breaking the glaſs or running over.

After three days, ſet the cucurbit on a gentle fire, that all the water may evaporate, till it leaves the *Crocus* behind dry, and it will be admirable for tinging glaſs, and perhaps the beſt of all; becauſe in the former you cannot find ſuch diverſities of colours as in this.

Another method of making CROCUS MARTIS. Though this is an eaſy method, it will make a *Crocus* of no leſs beauty and vertue than the former.

Take filings of *iron* or *ſteel* without any ruſt, let them ſtand in a reverberatory furnace with a very ſtrong fire; the heat being at leaſt to the fourth degree, till it becomes of the colour of purple.

Then take it out of the fire, and let it ſtand by to cool, and then put it into a veſſel full of water, and ſtir it briskly about, and then preſently pour off the water into another veſſel, which you may alſo repeat.

Thus there will remain in the firſt veſſel the iron that is not calcin'd, which, if you pleaſe, you may put again into a reverberatory furnace.

In the ſecond veſſel there will be the *Crocus*, which ſet over a gentle fire to evaporate the water.

But you muſt not decant off the water, tho' it does appear clear, after it has ſettled to the bottom; yet the water contains the moſt ſubtle parts of it imperceptibly ſuſpended in it.

Having well evaporated the water, you will have a very red powder, very fine and extraordinary, which keep for uſe.

Another way of making CROCUS MARTIS. This laſt way will be of ſome uſe to thoſe who ſhall deſire to have the iron or ſteel granulated, or in little drops, the metal whereof is difficult to melt.

Take a bar of either of the metals of five or ſix pounds weight, heat it as hot as is poſſible in a ſmith's forge, ſo that it may ſparkle when it comes out of the fire.

At the ſame time ſome other perſon muſt have a long ſtick of brimſtone ready, and large too, which will be beſt for this operation, which immediately upon the metals coming out of the fire, they muſt be thruſt one againſt the other over a great earthen pan full of warm water, into which the metal will drop in ſmall drops or *granuli*, melting like wax when touch'd by the ſulphur.

When this has been done, lay them layer by layer in a crucible with powdered brimſtone, and then ſet them in a reverberatory fire, where they will be reduc'd to a red powder, which grind and ſearce and keep for uſe.

The method of making CROCUS VENERIS. Take as much ÆS USTUM as you pleaſe, add to it its weight of green verdegreaſe, and as much *ſal armoniac* fix'd and fuſil; pound the whole well together, and dry them over the fire in a large iron ſhovel; then into the ſhovel pour lee of urine, and make the whole boil till the lee be intirely conſum'd; then put on more of the ſame lee, boil it again till the lee be conſum'd as before, and repeat this a third time.

Then pound or grind this mixture, and put it into a reverberatory that it may calcine well; then pound it again till 'tis reduc'd to an impalpable powder, and put it into an earthen glaz'd pot; pour upon the ſame lee of urine, wherein you diſſolve it, *viz.* to each pound of lee put four ounces of *ſal armoniac* fix'd and fuſile.

Then boil the whole over a gentle fire in aſhes for the ſpace of a quarter of an hour; then decant off that lee into ſome proper veſſel, for that will contain the tincture of the *æs uſtum*, and of the green, which it has extracted.

Then put more lee upon the matter, and boil it a quarter of an hour more over the ſame fire; then decant off that lee to the former: continue thus to water it with freſh lee, and decant it off to the former, as long as it will extract any lee from the matter.

Then take all theſe tinctured lees, and filter them through whited brown paper; then evaporate three quarters over a gentle fire.

Put the remainder into an alembick, with the helm (or head) on, and the receiver, and diſtil it till it be dry; then will you find at the bottom of the *alembick*, a *Crocus Veneris* of a very wonderful virtue for colouring glaſs, *&c.*

Another eaſier way of making CROCUS VENERIS. Take very thin plates of copper, put them into an earthen pot with common ſalt, layer upon layer; put this pot on the furnace, where let it ſtand till the matter be very red; then put the plates with the ſalt into cold water, and waſh them well to take away all blackneſs.

Repeat the laying of theſe plates with common ſalt, calcining them at the fire, and waſhing them as before, as often as you pleaſe. After the laſt time, pour warm water on that, wherein the plates have been extinguiſh'd, and let it ſtand for ſome time; then empty it, and you will find at the bottom of the veſſel a *Crocus Veneris* as red as blood. Waſh it well ſeveral times to cleanſe it, and dry it well with a linen cloth, and keep it for uſe for colouring glaſs.

There are ſome who content themſelves with taking *æs uſtum*, prepared with *ſulphur* and common ſalt, heating it red hot in the fire nine times, and quenching it as often in linſeed oil; and then dry it and powder it.

Another eaſy way of making CROCUS VENERIS. Take of copper ſimply calcin'd (ſee COPPER *to calcine*) one part, of *ſulphur vivium* eight parts; powder them well, and mix them together in a large crucible; ſet it into a coal fire in a little furnace, ſtirring the matter continually with an iron rod, till the ſulphur be conſum'd; repeat this operation five or ſix times, then caſt it thus refin'd into an iron pan of boiling water; ſtir it often with a ſtick, while the calx deſcends to the bottom; then the water being ſettled and clear, evaporate it to three fourths, to extract the cryſtals; or rather evaporate the whole, and you will find at the bottom of the veſſel a *Crocus Veneris* very fine and red.

Mr. CROSS was a famous copier in the reigns of King *Charles* I. and *Charles* II. A ſtory goes of him, that being employed by King *Charles* I. to copy ſeveral pieces in *Italy*, and having leave of the State of *Venice* to copy the famed *Madona* of *Raphael* that was in St. *Mark*'s Church, he performed the task ſo admirably well, that he is ſaid to have put a trick upon the *Italians*, by leaving his picture there inſtead of the original; which laſt he brought away with that celerity and caution, that, tho' ſeveral meſſengers were ſent after him, he had got ſo much the ſtart of them, that he carried the piece dexterouſly off. Afterwards, in *Oliver*'s days, the then *Spaniſh* Embaſſador here, *Don Alonſo de Cardenes* bought this picture when the King's goods were expos'd to ſale, together with the XII *Cæſars* of *Titian*, and King *Charles* on the *dun horſe* by *Van Dyck*; of which laſt there is a good copy by Sir *Peter Lely* in the *Middle-Temple* hall; all which (ſome ſay) remain in the *Eſcurial* to this day, though others affirm the picture of King *Charles* on the dun horſe, is now in poſſeſſion of the Duke of *Bavaria*, who bought it of one *Mynheer Van Cullen*. This Mr. *Croſs* copied likewiſe admirably well *Titian*'s *Europa*, which picture of his is now in the collection of the Duke of *Kent*.

CRUCIBLE is a little veſſel ordinarily made of earth, ſometimes iron, without any handle; us'd by coiners, goldſmiths, glaziers and other artificers, for melting and calcining gold, ſilver, or other metals whereon they work.

Earthen *Crucibles* are made of glaz'd earth, with ſtone potſheards pounded and ſifted; they are of various ſizes, but generally of the ſame form, which reſembles that of an inverted cone or pyramid.

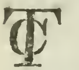
'Tis theſe are chiefly us'd in coinage, as being the only ones in which gold will melt without irritating.

Iron *Crucibles* are in the forms of little pails without handles, made of iron well forg'd and beaten; in theſe are melted ſilver, copper, &c.

There are earthen *Crucibles*, that hold from a hundred to three or four hundred marks; but thoſe ordinarily uſed are but of a hundred; the iron ones are larger, ſome holding twelve or fifteen hundred marks. Theſe are not taken off the furnaces when the plates are to be run, but the metal is laden out with an iron ladle.

It is a rule never to put ſo much metal in a *Crucible* as it will hold.

The *Crucibles* us'd by goldſmiths and founders, are like thoſe us'd in coinage; thoſe of chymiſts, *&c.* are of all ſizes, according to the quantity and quality of the metal to be put in them.



THEODORE CRUGER or GREUGER, an engraver, uſed this mark.

CRYSTAL is a kind of mineral; or rather a tranſparent ſtone, white like a *diamond*, but much inferior to it in luſtre and hardneſs; it is us'd for many purpoſes.

The antients were but little acquainted with the nature of *Cryſtal.*

Pliny treats of it as water hardened and petrified, which ſeems to have been the popular opinion of thoſe times; but experience has taught the contrary, for by a chymical analyſis, inſtead of reſolving into water, it yields nothing but a calx, earth and ſalts.

As for the places where *Cryſtal* is found, they are both rocks and rivers. *Pliny* tells us, that he has ſeen it dug from off the higheſt and rougheſt rocks of the *Alpes*, and thence probably it has taken the name of *rock Cryſtal.*

And whereas it is ſometimes found in rivers and brooks, yet it is not form'd there; but waſh'd down thither from off the mountains by violent rains.

Several mountains of *Europe*, and ſome of *Aſia*, produce *rock Cryſtal*, and the *French* relation of *Madagaſcar* (if we can give credit to it) informs us, that that iſland yields more than all the world beſides.

The perfection of *Cryſtal* conſiſts in its luſtre and tranſparency; that cryſtal which has inclos'd in it ſtraws, duſt, clouds, *&c.* is little valued.

It is frequently found hexagonal, the edges inimitably fine and accurate.

It is cut or engraven in the ſame manner, and with the ſame inſtruments, and by the ſame workmen as diamonds.

As to the formation of CRYSTAL, it is delivered by F. *Franciſco Lana* in the philoſophical tranſactions to this effect.

I have, ſays he, in the valley *Sabbia*, obſerv'd a ſpacious round of a meadow, ſome parts of which were bare of all herbs;

wherein, and no where elſe thereabouts, *Cryſtals* are generated, all ſexangular, both points terminating in a pyramidal figure, likewiſe ſexangular.

The country people told me, they were produc'd from the dews, becauſe forſooth, being gathered over night, there would others ariſe only in a ſerene and dewy sky.

But having obſerv'd, that there was no mark of a mine thereabout, I concluded it might be a plenty of nitrous ſteams; which at the ſame time might hinder the vegetation on thoſe places, and coagulated the dew falling thereon; for *nitre* is not only the natural coagulum of water, as is manifeſt in artificial glaciations, but ever retains the aboveſaid hexangular figure; which, by the way, may be the cauſe of the hexangular figure of ſnow.

—— Since *Cryſtals* are only found in thoſe narrow places 'tis probable, that thence are rais'd thoſe exhalations, which concrete the dew; after the ſame manner as the vapour or exhalation of lead coagulates quickſilver.

Rohault ſhews, that cryſtal, diamond, *&c.* muſt have been originally liquid from their figure, which is ſuch as drops of water of the ſame ſize muſt neceſſarily have; and ſuch as globules of meal or flower, heap'd up and compreſs'd by their own weight, might have; for as each cryſtal is encompaſs'd and clos'd round with ſix others, ſo it becomes modelled into an hexangular body, conſiſting of equal and ſquare ſides.

Mr. *Boerhaave* takes *Cryſtal* to be the proper matter or baſis of all gems or precious ſtones, which aſſume this or that colour, *&c.* from the different admixture of mineral and metalline fumes, with the primitive cryſtalline matter.

CRYSTAL is alſo a name given to a factitious body caſt in the glaſs-houſes alſo call'd *cryſtal glaſs.*

This is in effect a glaſs; but carried in the melting, and in the matter of which it is compos'd, to a degree of perfection far beyond the common glaſs, though it comes far ſhort of the whiteneſs and vivacity of *Cryſtal.*

CRYSTAL, *the way of calcining natural (or rock) cryſtal, to make an extraordinary* FRITT.

Altho' we may imitate natural *Cryſtal* by help of art, and make as fine with the materials we have ſhewn elſewhere how to prepare; yet the way we are going now to deſcribe of making a fritt of natural *Cryſtal*, will make one ſo extraordinary, that it will ſurpaſs in beauty all we have ſhewn the preparations of.

Make natural *Cryſtal* red hot in a crucible covered cloſe; then extinguiſh it in water, and reiterate the ſame eight times, then dry it well, and grind it on a ſtone to an impalpable powder.

Often purify this powder of *Cryſtal*, after the ſame way as is ſhewn for the purifying *polverine* of *Rochetta*, which ſee, obſerving all what is ſaid on that ſubject.

Then mix that cryſtalline matter with about one third part of ſalt extracted from *polverine* of *Rochetta* prepar'd, make a fritt of it, then put it in a pot well heated in the furnace, and when it is in good fuſion, add to it a proportionable doſe of prepar'd manganeſe.

After that, often pour it into the water to purify, as is noted in ordinary *Cryſtal*, and purify it very well at the fire before you work it, and you will have *a Cryſtal* more ſhining and beautiful than you have otherwiſe ever ſeen

The way of preparing natural CRYSTAL. This is done by calcination, which to perform well, obſerve the following directions.

Take the faireſt natural *Cryſtal* you can get, that being the baſis for artificial gems; it is no matter whether it be in great or ſmall pieces.

With theſe pieces of *Cryſtal*, fill a large crucible, cover it with a cover made of the ſame earth, that is ſomewhat broader than the mouth of the crucible, for fear aſhes or coals ſhould tumble in.

Set this crucible in burning coals in a little furnace, and when the *Cryſtal* is well heated, caſt it into a veſſel of cold water; the more water there is, ſo much better will the calcination be perform'd, becauſe the cold of it is ſo much the greater.

Then take it out of the water, and dry it in an earthen ladle; then put it into the ſame crucible to be heated again, taking care to cover it well; then caſt it again into freſh cold water, and repeat heating it and quenching it thus twelve times, changing the water each time.

You may know if your *Cryſtal* be well calcin'd, for it will eaſily break and crumble; if there appear in it any black veins, you muſt take care to take them all clean out by breaking them, and do this till only the white remains behind; then it is well prepar'd.

After you have well dry'd your *Cryſtals* thus calcin'd, grind them to an impalpable powder on a marble or porphyry ſtone, by putting a little on at a time, and ſearce it well through a fine ſilken ſieve.

This powder of *Cryſtal* being what is us'd for all artificial gems, it will be proper to keep a good quantity ready by you, which you may always have recourſe to in working.

If you would ſucceed very well in this art, you muſt not uſe ordinary *fritt* of *Cryſtal*, how good and fair ſoever it be, nor *chalcedony*, nor *tarſo*, nor any other ſtones; for the glaſs made of them is far leſs fair and reſplendent than that made of natural *Cryſtal*, which has the moſt luſtre, and approaches the neareſt to precious ſtones.

To make PEARL *colour in* CRYSTAL. True pearl colour is ſo fine and ſhining, that it might ſeem difficult to give it to cryſtal; yet it is ſo eaſy, that tartar alone does it.

Thoſe who have a mind to perform this proceſs, muſt calcine their tartar, till it becomes white. See *calcination* of TARTAR.

The having well purified the fritt of the natural *Cryſtal*, and it being in a good fuſion in the furnace, this white tartar muſt be caſt into it at ſeveral times, mixing the whole well each time, which muſt be continued to be done till the glaſs becomes of a pearl colour; for there is no other rule in this caſe than experience to guide your ſelf by.

When the colour is come to perfection, it muſt be wrought preſently, becauſe the colour will ſoon be loſt; but works may be made of it of extraordinary beauty.

To make a very fair CRYSTAL *of ſalt of lime.* The ſalt of lime, with which walls are built, is now more in uſe in making glaſs.

It is much ſtronger than the ordinary ſalt, and being well purified, you may put two pounds of it to a hundred pounds of ſalt of *polverine*, of which a *fritt* muſt be made and purified well, as is ſhewn. Of this *fritt*, you may make common glaſs, and alſo *Cryſtal* and *cryſtalline* fair and beautiful.

Ferantes Imperatus recommends the ſalt of teſtaceous fiſhes, ſuch as oyſter ſhells, *&c.* as very proper for making glaſs. There may be made of theſe ſhells a very good lime proper for cement, and which yields a very ſtong ſalt; but tho' this ſalt makes the glaſs white, yet it is not ſo tranſparent as that made of *kali*, and will moſt of it run in the pots into *ſandever*.

The way to make a very fine and perfect CRYSTAL. This cryſtal will be white, very bright, clean and beautiful, if care be taken in the managing of it in the working.

Take *Cryſtal* fritt, prepar'd, and put it into a little pot in the great furnace, putting into it by little and little, and at ſome interval of time, as much *mangane ſe* of *Piedmont* as is ſufficient, after it has been prepar'd.

The *fritt* being thoroughly melted, you muſt take out the pot, and put it in a great earthen veſſel full of cold water, or in clean wooden veſſels.

This way of putting the fritt into water ſerves to take from it the *ſandever*, which is noxious to the *Cryſtal*, and makes it obſcure and cloudy, and very diſagreeable to the ſight.

Then put it again into a clean pot, and being melted, caſt it again into water, which muſt be repeated until the *Cryſtal* be ſeparated from all this ſort of ſalt.

In the laſt place, let it ſtand five or ſix days in the pot in the oven to boil, and ſtir it as little as poſſible with the iron; for it is apt to diſcolour it, and ſo make it blackiſh.

Being well boil'd and clear, ſee if it hath *manganeſe* enough, which may be known by inſpecting it, *(viz.)* if it be white; but if it be ſtill greeniſh, you muſt add more *mangancſe* to it, and then let it boil till it is clear, and of a ſhining colour.

The property of *manganeſe* added to it in due quantity is to perfect the *Cryſtal*, and to take from it a foul and dull green, and give it a bright and ſhining whiteneſs; you muſt take heed to add by little and little, and by degrees; otherwiſe it will rather ſpoil than perfect the cryſtal, blacking it, and taking away its luſtre.

All this depends on the skill and diſcretion of the workman, for there is no certainty or ſtanding rule for the quantity to be added.

As ſoon as your *Cryſtal* is fine and ſhining, you may uſe it without delay, for what veſſels or other works you deſign to put it to; but in the mean while, you muſt have leſs fire than for common glaſs, and it muſt be very clear and without ſmoak, for reaſons elſewhere given.

Moreover the workman muſt take care, that his iron rods be clean and well poliſh'd, and that the necks or collets of the glaſſes where the irons touch them, be always kept out of the pots of *Cryſtal*, becauſe the iron always diſcolours the *Cryſtal*; wherefore particular care is to be taken as to that matter.

None of our modern workmen (or at leaſt very few of them) take the pains of this way of ſeparating the *ſandever* from their materials, by caſting them into water; they content themſelves with skimming it off with an iron ladle, when it ſwims on the top; tho' if it does not all ſeparate, the *Cryſtal* and glaſs will be leſs clear and fine.

The way to extract ſalt of FERN, *which will make a fair* CRYSTAL. The daily experience of ſalt of *fern* in the glaſs-houſes, aſſures us of its uſefulneſs in making glaſs.

It grows on mountains and heaths. It ought to be cut from the end of *May* to the middle of *June* (*i. e.* in *France*,) for then it is beſt and yields more, better and whiter ſalt than if cut at any other time; for if it be let alone to dry of it ſelf on the ground, it will give but very little ſalt, and that not good neither.

It muſt therefore be cut in its full growth, juſt as it runs to ſeed; then let it dry, and burn it.

You will have from it very good aſhes, from which (obſerving the rules given for the ſalt of *polverine*,) a good and fine ſalt may be extracted; which being afterwards purified with it, and *tarſo* or very fine ſand, a *fritt* may be made, which will yield a very fair *Cryſtal*, much better than the ordinary, and will be ſtrong; and bend much more than one would conceive the nature of *Cryſtal* would permit; ſo that it may be drawn into fine threads, as has been often experienc'd. With this *fritt* may be made a fine gold colour, if you mix no ſalt of *tartar*, and which will be as fine as that made of ſalt of *polverine*.

This is as good as the firſt, to make all ſorts of veſſels, which will be as fine alſo, if the ſalt be well purified.

Obſervations for a gold colour in CRYSTAL. Gold being the pureſt and moſt perfect metal in nature, muſt needs require materials very pure to imitate it.

This obliges us here to note, that to make a *Cryſtal* of a fine gold colour, the fritt muſt be made of fine ſalt of *polverine*, prepar'd and purified as is taught elſewhere, which is the only means of obtaining it.

For if there ſhould be mixt any of the fritt made of the ſalt extracted after the common way, by the help of *tartar*, the colour would be very imperfect, wanting the true ſplendor and beauty.

To make a sky colour and ſea-green in CRYSTAL. This fine colour requires a *Cryſtal fritt* well purified from its ſalt, and that has not been put into water.

Put ſixty pounds into a pot, and having well prepar'd it, put in one pound and half of ſcales of copper in powder, the preparation of which is ſhewn, with four ounces of *zaffer* prepar'd and mix'd together, and ſtir the whole well with the glaſs for the ſpace of two hours.

Then examine if the colour be to your mind, and let it ſtand at reſt for twenty four hours; then ſtir the whole again as before, that it be well mix'd with the glaſs, and the colour incorporated with it; then it may be wrought.

The colour may be heightened as you pleaſe, but take care you do not make it too high.

If you mix with *fritt of rochetta*, as much *Cryſtal fritt*, you'll have as fine a blue as can be wiſh'd.

A sky colour or ſea-green in CRYSTAL. You muſt uſe for this colour, which is a little cloſe, the ſame *Cryſtal fritt* made with *rochetta* or *polverine* of the *Levant*; and having fill'd a pot with it, let it be well purified, taking off the ſalt that ſwims at top; then put to it twenty pounds of metal, ſix ounces of the powder of calcin'd copper, by little and little ſtirring it well, obſerving the ſame rules given for the ſeagreen before. Then you will have a very admirable colour, which you may make lighter or deeper as you pleaſe.

Two hours after, ſtir it again well, and you may then examine if the colour pleaſes you, in which caſe, let it ſtand ſtill twenty four hours without any ſtirring, and then it may be wrought as before.

The way to tinge natural CRYSTAL *of a viper colour.* The green viper colour is very dangerous to make by reaſon of the materials, of which it is compos'd, if great care be not taken.

Take two ounces of rock *Cryſtal* of a good water, two ounces of crude *antimony*, and as much orpiment, with one ounce of *ſal armoniac*; reduce theſe three laſt into powder, lay the pieces of *Cryſtal* layer upon layer in a good crucible, cover it with another that is bored through the bottom; lute them well together, and when the lute is dry, ſet them into a furnace in the middle of the coals; let them be gently lighted, that the furnace may grow hot by degrees.

It will ſmoak very much when it firſt grows hot, wherefore the operation muſt be perform'd in a large chimney, that the ſmoak may fly away, nor muſt you ſtay in the laboratory, becauſe it is very dangerous, and may prove mortal.

Let the fire kindle of itſelf, and go out, and the crucible grow cold, then take out the pieces of *Cryſtal* that lye on the top of the crucible, which will have the colour of rubies, and be mark'd with fine ſpots; and thoſe that are at the bottom will for the moſt part have the colour of vipers.

Separate the other pieces from them, which will be of other colours, and poliſh the whole at the wheel like other ſtones; then with foils you may ſet them in gold.

Theſe ſtones will be of a very agreeable colour.

To make in natural CRYSTAL, *the colour of* rubies, topas, opal, gyraſol *and others.* It does indeed ſeem ſomething ſtrange that *Cryſtal* mix'd with matters that tinge them, ſhould in the ſame veſſel receive ſo many different colours.

But if it be conſidered, that the ſpirits of theſe matters have virtues different from thoſe of their bodies, you will not ſo much wonder at theſe diverſities.

The pieces which lie higheſt, are the moſt penetrated by theſe tinging ſpirits, which always aſcend, and ſo give them more vivacity and colour; and ſo to the others in proportion to their orders.

For this operation. Take two ounces of orpiment of a yellow colour approaching gold or ſaffron, and as much white *arſenic*, one ounce of crude *antimomy*, and an ounce of *ſal armoniac*, reduce them all to powder, and mix them together; with this powder, ſtratify pieces of natural *Cryſtal*, in a large crucible, putting the leaſt pieces to the bottom, and the biggeſt at the top, which ought to be fine and without ſpots.

The crucible being fill'd with the powder and *Cryſtal*, cover it with another bored at bottom, lute them well and let the lute dry. This crucible is bored to let the fumes of the materials aſcend through the hole, and by that means tinge the *Cryſtals* in paſſing, which they would not do ſo well if they paſs'd out at the ſides.

When the lute is dry, ſet the pot in the furnace, and cover it with coals up to the middle of the crucible towards the top, then put ſome live coals to them, that they may kindle by themſelves by degrees; the coals ought to be large ones and made of oak.

Go out of the laboratory preſently to avoid the fumes, which are dangerous as was ſaid before, but prepare the fire ſo well that it may kindle of itſelf, and burn well that the buſineſs may ſucceed, and let the fire go out of itſelf, taking care that no air can get in at the mouths of the crucibles, for that would make the *Cryſtals* break, and then they would be good for nothing.

When the crucibles are grown cold, unlute them, and take out the *Cryſtals*, the greateſt part of which will be tinged with the colours beforementioned; let the beſt of them be poliſh'd at the wheel, which will alſo brighten their colours, and make them look like oriental ſtones, and they will be fair and hard as they are.

All the ſucceſs of this ſecret conſiſts in the orpiment, which muſt be of the colour of gold; and if you ſhould not ſucceed the firſt time, you muſt try a ſecond.

An admirable BLUE CRYSTAL. To procure this fine colour take one ounce of powder of *Cryſtal*, one dram and fifty ſix grains of fine ſalt of *tartar*, the whole reduc'd to a fine powder, put it into a crucible covered and luted, which bake and purify twenty four hours in a glaſs-houſe furnace, then ſet it to cool gently twelve hours in the annealing furnace, and you will have very admirable *Blue*, which you may cut and poliſh, *&c.*

The way to make a ſalt of ſeveral vegetables, which will produce a CRYSTAL *of a wonderful fineneſs.* It has been obſerv'd, that the ſalt which ſerves to make glaſs is extracted from *polverine* of the *Levant*, from *rochetta* and *ſoda*; and the way of extracting it is there ſhewn; here I ſhall acquaint you, that any vegetable that abounds with alkalious ſalts is proper to make glaſs and *Cryſtal*, by preparing its aſhes as there ſhewn.

Several plants are good for this purpoſe, but thoſe that grow near the ſea-ſide are always the beſt, becauſe they acquire a great deal of ſalt by their nearneſs to the ſea.

Alga is one of them. *See* ALGA.

Pot-aſhes are alſo proper on this account, they are brought from *Poland*, *Ruſſia*, and *New England*; and are aſhes, for the moſt part of firs and pines, and their apples.

The ſalt of all ſorts of aſhes may ſerve for common (or green) glaſs, notwithſtanding that of the aſhes of the common thiſtle is the beſt; but all ſorts of thiſtles are good.

Next to *thiſtles*, hops are the beſt, taking both ſtem and branch when the flowers are gathered.

Among trees the *mulberry* is the beſt (*C. M.* ſays, the *bramble buſh)* as alſo *geniſta ſpinoſa*, and the *haw-thorn*, and *black-thorn*, which bears black-berries, and among the ſea-plants, *kali ſpinoſum*.

So that it ſeems, that thoſe plants which are thorny and prickly afford in their kind the beſt and moſt ſalt.

All ruſhes and reeds which grow in marſhes and in pools, and in ditches of water, and on banks of rivers, yield a great deal of ſalt fit for theſe purpoſes.

Next to the beforementioned are all bitter herbs, as *hops*, *wormwood*, *carduus benedictus*, *centaurie*, *gentian*, *ſouthernwood*, *tanſy-wood*, which they uſe in dying wool, the heads of *poppies* and ſeveral other plants; *tobacco-ſtalks*, all leguminous plants have the ſame vertues; *bean-cods* and *ſtalks* yield an admirable ſalt for making *Cryſtal*, *peas*, *vetches*, *millet*, *lupine* and *lentils*, as alſo *cabbage-heads*, and ſeveral other ſorts of plants.

Add to theſe milky plants, all ſorts of *tithymals* or *ſpurges*, *cataputium*, the *fig-tree*, *vine branches* and *ſow-thiſtles*.

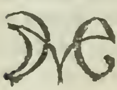
Of all the fix'd ſalts which are extracted from plants, obſerve, that thoſe are the beſt that are freeſt from earth, and all ſorts of heterogeneous bodies, and which are united in the hardeſt and whiteſt lumps, and are moſt ſharp to the taſte.

That the beſt aſhes and fulleſt of pure ſalt run ſooneſt in the furnace.

That thoſe are the beſt aſhes of vegetables that are made while they are green, and of the biggeſt branches.

That thoſe ſalts muſt be diligently kept in a dry place, remote from any moiſture, that may be hurtful to them; that the aſhes of *oak* which partake of a vitriolick nature make a glaſs of a darker colour; and *aſh* and *hawthorn*, their ſalts being more *nitrous*, make the whiter-metal.

C. Schoenius, ſignifies *Martin Schoenius*, a *Calembach* painter and engraver in the flouriſhing of *Albert Durer*. He died in the year 1486. ſome of the curious ſuppoſe him to be the ſame with *Buonmartino*.



CUERENHERT, his mark in ſeveral *Turkiſh* ſtories, and various ſubjects, invented by *Martin Hemsherk*.

CURIOSITY, is repreſented in painting, *&c.* by a woman having abundance of ears and frogs on her robe; her hair ſtanding up an end, wings on her ſhoulders, her arms lifted up, ſhe thruſting out her head in a prying poſture.

The ears denote the itch of knowing more than concerns her, the frogs are emblems of inquiſitiveneſs, by reaſon of their goggle eyes; the other things denote her running up and down to hear and ſee as ſome do after news.

CUSTOM, is repreſented in painting, *&c.* by an ancient man in a walking poſture with a grey beard, leaning on a ſtaff with a label inſcrib'd, *vires acquirit eundo*, with a burden of muſical inſtruments and a grindſtone by him.

His age ſhews, that the more he advances in time the firmer does he ſtand, intimated by the motto, to which agrees the grindſtone alſo, for if it be not turned, it has not the force to wear the knife by grinding; the laws of cuſtom are valid and always prevail.

CUTTING *in wood*, is a particular kind of ſculpture or engraving, denominated from the matter wherein it is employ'd.

It is us'd for various purpoſes, as prints and ſtamps for printing paper, linens, calicoes, *&c.*

The invention of cutting in wood, as well as that of copper is aſcrib'd to a goldſmith of *Florence*; but they both owe their perfection to *Albert Durer* and *Lucas.*

One *Hugo de Carpi* invented a manner of cutting in wood, by means of which the prints appear'd as if painted in *clair obſcure*, in order to this he made three kinds of ſtamps for the ſame deſign; which were drawn after one another through the preſs for the ſame print. They were ſo conducted, that one ſerv'd for the grand lights, a ſecond for the demi-teints, and a third for the out-lines and the deep ſhadows.

The art of *cutting in wood* was certainly carried to a very great pitch a hundred and fifty years ago, and might even vie for beauty and juſtneſs with that of engraving in copper.

At preſent 'tis but in a low condition, as having been long neglected, and the application of artiſts wholly employ'd on copper, as the more eaſy and promiſing province; not but that their wooden cuts have the advantage of thoſe on copper on ſeveral accounts; chiefly for figures and devices in books, as being printed at the ſame time, and in the ſame preſs as the letters; whereas the other requires a particular impreſſion in the rolling-preſs.

The *cutters in wood* firſt prepare a block of the ſize and thickneſs requir'd, and very even and ſmooth on the ſide to be *cut*, the wood of theſe blocks is uſually peartree or box, though the latter is the beſt, as being the cloſeſt and leaſt liable to be worm eaten.

On this block they draw their deſign, with a pen or pencil juſt as they would have it printed.

Thoſe who cannot draw their deſign, make uſe of the deſign furniſh'd them by another, faſtening the paper upon the block with a ſort of paſte made of flower and water with a little vinegar, the ſtrokes or lines turn'd towards the wood.

When the paper is dry, they waſh it gently over with a ſpunge dipp'd in water; which done, they take off the paper by little and little, ſtill rubbing it a little firſt with the tip of the fingers; till at length there be nothing left on the block, but the ſtrokes of ink that form the deſign, which mark out ſo much of the block, as is to be ſpared or left ſtanding.

The reſt they cut off, and take away very curiouſly with the points of very ſharp knives, or little chiſſels or gravers, according to the bigneſs or delicacy of the work.

CUTTING in *painting*, is the laying one ſtrong lively colour over another without any ſhade or ſoftening. The *Cutting* of colours has always a diſagreeable effect.

D.

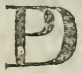
D. Stands for *Domenichino* of *Bologna*, a famous painter and inventer.

DANGER is repreſented in painting, *&c.* by a ſtripling walking in the fields, treading upon a ſnake, which bites his leg; on his right ſide is a precipice, and a torrent on the other; he leans only upon a weak reed, and is ſurrounded with lightning from heaven.

His youth ſhews the danger he is in; his walking ſhews that men walking through flowry fields of proſperity, fall into ſome calamity unawares; the reed ſhews the frailty of our life in continual danger; the lightning, that we are ſubject beſides to danger from heaven.

HENRY *and* JOHN DANKERS. *Henry* was a good landſcape painter, and employed by King *Charles* II. to paint all the ſea-ports of *England* and *Wales*, and alſo all the royal palaces, which he performed admirably well; he was firſt bred a graver, but upon the perſuaſions of his brother *John*, took to painting; he ſtudied ſome time in *Italy* before he came to *England*; he worked for a great number of our gentry, and had good rates for what he did, being eſteemed the neateſt and beſt painter in his way of that time. He left *England* in the time of the *Popiſh* plot, being a *Roman* Catholick, and died ſoon after at *Amſterdam*.

As for *John Dankers*, he was a good hiſtory painter, and lived not many years after his brother; dying in the like manner in *Amſterdam.*



PETER DARET, who engrav'd various portraits, us'd this mark.

The DARK *way of* PAINTING. As to the colours, they are prepar'd in the ſame manner as the other colours are for the light way of painting, (for which ſee the article LIGHT *way of* PAINTING in letter L) except that there muſt not be any egg us'd in them.

In the firſt place, you muſt mark the paper with *black lead*, if they be white; and with *tobacco-pipe clay*, if they be dark. This you may do at pleaſure, becauſe you can't ſpoil it; only take care that you mark out the figures as lofty with the landſcapes as you can; then take a little blue *verditer* and *flake* white for the sky, in which you need not be difficult, becauſe you muſt go over it again.

Then daſh out at pleaſure, and where you pleaſe with the *blue*, with a little *lake*, or *roſe-pink* and *flake white.*

Then ſtrike at the bottom of the sky, but not on the blue, with a little *red-lead* and *flake white*, and a little yellow; all which may be done as quick and rough as you pleaſe.

After you have done this, lay the diſtant hills with a little *blue verditer* and *flake white*, but inclining moſt to the *verditer*; then for the nearer hills, lay them with the ſame colours, and a little roſe pink added to them

With this colour alſo you may lay diſtant houſes or towers; and then give a ſtrike on the colour that is the neareſt your pattern with *flake white*, blue *verditer* and *Dutch pink*; then lay it here and there under the *white* and *yellow*; add a little *Spaniſh brown* to the *green*, and ſo whatever green you pleaſe to make, do it by dipping your pencil into any other colour, mixing it with the aforeſaid *green* for variety.

Here and there you may intermix a purpliſh colour, and ſo work in all manner of colours, according as you ſhall pleaſe.

Obſerve to make the loweſt colours the darkeſt part of the landſcape, and lay in the houſes and trees, as you come down with the grounds. All this you may do at pleaſure, for the finiſhing will ſet all to rights; nor will it be any matter, if in the colouring your ground is gone over with your colours here and there.

Then draw your figures more perfectly with *verdeſey*, *carmine* and *litmoſe.* This likewiſe you may do without fear; becauſe when you come to lay the colours of the figures, that will make all right.

After you have drawn the figures, look and fill up every place that is left with colour; and afterwards go over the sky that you made before, with a large pencil, with a little *blue ſmalt* and *flake white* mix'd well to a fair sky, leaving the light part of the sky clear at the bottom; then ſhadow the remote hills here and there with *blue ſmalt* thin; and where they are deepeſt, with the thick part of the colour: then do the purpliſh hills with *blue ſmalt* alone, and ſometimes *carmine* and *litmoſe*, or *gambooge* and *litmoſe*.

Make the diſtances in as many different colours as you can, letting your diſtant *blue greens* be ſhaded with *litmoſe* and *gambooge*, to which a little *indigo* may be added. Shade the diſtant *yellow greens* with *gambooge* and *verdegreaſe*; and *reddiſh greens* with *gambooge*, *verdegreaſe*, and *red-oaker*.

Let ſome of the diſtant grounds incline to *blue*, ſome to greeniſh, ſome to yellowiſh, and ſome to reddiſh.

When you have ſhaded the diſtant, ſhade the nearer things, ſuch as trees, cattle, rocks, ruins, &c. For blue trees, take *indigo* and *verdegreaſe*; if yellow, *gambooge* and *verdegreaſe*; and in the darkeſt, add a little *indigo*; if reddiſh, *red-oaker* and *verdegreaſe*, and ſhade ruins with *gambooge* and *litmoſe*; if reddiſh, add *carmine*; if bluiſh, add *litmoſe*; obſerving that the darkeſt ſhade for cattle, ruins, grounds, or the ſtumps of trees, is generally *carmine*, *verdegreaſe* and *litmoſe*; only in the darkeſt of all, add a little *indigo*.

This will do for cattle, birds, buildings, dark grounds, dark garments, the darkeſt ſhade of the face, and ſtalks of trees.

When the diſtant things have been ſhaded, ſtrike the dark ſhades under the figures, which will be a direction to you in the grounds; and ſo ſhade the reſt of the grounds with a *yellow*, *bluiſh*, and *purpliſh* ſhade, taking care not to mix any earth colours with them; unleſs it be black with *gambooge* or *indigo* with *carmine* and *verdegreaſe*, and this muſt be done but ſeldom.

If the *litmoſe* and *verdegreaſe* be both thick, you will ſeldom want earthy colours; and ſo finiſh the ſhades in the landſcapes.

For ſeas, uſe *litmoſe*, *gambooge*, and *indigo*, mixing it to a purpliſh ſea-green; for dark waters, *indigo*, the darkeſt *carmine* and *verdegreaſe*, inclining moſt to *indigo*; if light waters, thin *indigo*.

Herbs are to be done after the ſame manner as trees.

Then lighten the landſcape thus: for clouds, uſe *French oaker* and *flake white*, laying it thin at firſt, and then work it thicker with *red lead* and *flake white*, or *carmine* and *flake-white*, which you muſt do to all the lightening colours.

After you have done the landſcape thus far, you may lay in the figures in the following manner.

Draw the figures with *carmine*, *verdegreaſe*, and *litmoſe* without fear; for if you are out, the colouring will make all right.

Then lay in the proper colours, and cover the ſtrokes you have drawn; becauſe theſe not being perfect, are only for a direction for you in laying the colours bold and free.

In colouring the garments, for *blue* ones, uſe *blue* and *white*; for a roſe colour, *carmine* and *white*; for green, *blue verditer*, *Dutch pink* and *white*; for a purple, *blue verditer*, *roſe pink* and *white*; for yellow, *roſe pink*, *Dutch pink* and *white*, and ſo add *white* to any earthy colour, according to your fancy.

In colouring faces, for a fair one, uſe *red lead*, *carmine* and *white*; for red, more *red lead*, and ſome *yellow*; for dark ones, add a little *litmoſe*; for brown, add ſome *umber* or *yellow oaker* to the *red lead* and *white*.

For fair hair, take *umber* and *white*, or *yellow oaker* and *white*; for dark, *burnt umber*, or *Spaniſh brown* and *white*

Firſt, lay the garments, then the faces, then the hair, and then the girdles.

Having thus laid the figures, draw out the figure as perfect as you can with *verdegreaſe*, *litmoſe* and *carmine*; becauſe this will be a guide to you in all the ſhadows.

When you have done this, ſhadow them thus: for a roſe colour, uſe thin *carmine*; in the darkeſt ſhades, uſe *roſe pink* and *carmine*, or *lake*; for a deep blue, gloſs over the *blue* with *ſmalt*; and when it is dry, ſhade with *litmoſe*, and in the darkeſt parts with with *Colens earth* and *carmine*; for yellow, *gambooge* and *umber*; for a ſtraw colour, *gambooge* and *black*; for purple, *carmine* and *litmoſe*; for a cloth colour, *carmine*, *verdegreaſe* and *litmoſe*.

For linings, uſe *litmoſe*, *gambooge* and *indigo*.

For cattle, buildings, or ruins, uſe *verdegreaſe*, *litmoſe* and *carmine*; if the ſhadows are to be blue, take more *litmoſe*; if yellow, *gambooge*; if red, *carmine* and *verdegreaſe*.

For umbering the faces, uſe *carmine* and *verdegreaſe*, adding *litmoſe* for a fair one.

With this ſhading, you may ſhade all faces, taking care that if the face is to be fair, to add more *litmoſe*; if red, more *carmine*; if yellow, more *verdegreaſe*.

After that the faces have been ſhaded with theſe ſhades, then for a fair face, take *French yellow-oaker* and *flake white*, and heighten the lighteſt parts of the face; then add a little *carmine*, and lighten the darkeſt ſide; and afterwards ſmooth the edges of the light parts, that the colours may lie as if put on at once.

Having done this, go over the dark ſhades with *carmine*, *verdegreaſe* and *litmoſe* to make them look clear, giving the darkeſt ſome touches with the ſaid colours.

Then ſhade the bluſhes of the fair face with *carmine* and a little *red lead*; and afterwards ſhade the bluiſh parts of the face with a little *litmoſe*, taking care not to put it where the red ſhould be.

After the faces have been umbred, ſhadow the hair of the figures as follows:

For fair yellow hair, uſe *verdegreaſe*, *carmine* and *gambooge*; if darker, more *litmoſe* ; if very dark, *carmine*, *verdegreaſe*, *litmoſe* and *indigo*, or *black*.

After the faces have been lightened by their proper colours, then lighten the hair, and for a fair yellow hair, uſe *French-oaker* and *flake white* ; for darker, add more *oaker* and *litmoſe*, and ſo more of the ſame for the darkeſt.

When you are finiſhing the faces with blue ſhade, which is thin *litmoſe*, ſtrike the darkeſt ſides of the hair with it ; and this will make it look ſoft and well.

The way of finiſhing the garments.

For a roſe colour garment, uſe *carmine* and *flake white*, and here and there uſe a little *yellow* or *red oaker*.

For a green garment, uſe *blue verditer*, *Dutch pink*, and *flake white*.

For a crimſon one, uſe *carmine* and a little *flake white*.

For a yellow garment, uſe *Dutch pink* and *flake white*.

For a cloth colour garment, uſe *Spaniſh brown* and *flake white*, or *umber* and *flake white*, or *black* and *flake white*, or *umber*, *litmoſe* and *flake white*; or any mixture of colours, according as your fancy directs you, adding *flake white* to it.

As to the farther finiſhing of the face, it is the ſame as that mention'd in the *light way of painting* ; but uſe no egg at all.

DARK TENT a portable *camera obſcura*, made not unlike a desk, and fill'd with optick glaſſes, to take proſpects of landſcapes, buildings, fortifications, &c. See CAMERA OBSCURA.

DAVID, King of *Iſrael*, is repreſented with brown hair, a ruddy complexion, and with a long beard.

NATURAL DAY is repreſented in painting, &c. by a winged boy, with a circle in his hand, in a chariot above the clouds, with a lighted torch. The chariot drawn by four horſes, one white, one black, and the other two bay, ſignifying the four parts that make up a natural day, *i. e.* the riſing and ſetting, noon and midnight; all the time the ſun ſpends in going once round the whole orb, which the circle ſhews.

D. B. ſignifies *Bernard Gallo*, call'd *the ſhort*. He engrav'd ſeveral works, and among the reſt *Ovidii Metamorphoſes*, and the old and new Teſtament, printed at *Lyons* 1559.

A DEAD COLOURING [in miniature] to repreſent death.

In the firſt place, lay on *white orpiment* and *oaker* very pale, and then proceed with *vermilion* and *lake*, inſtead of *carmine* and a great deal of white, and work thereon with a green mixture, in which is more *blue* than of any other colour, that the fleſh may appear livid.

The teints muſt be the ſame as for another colouring; but there muſt be more of them *blue* than *yellow*, particularly for the retreating parts, and about the eyes, and the yellow teint is to be us'd for the parts which advance fartheſt out.

Theſe teints muſt be made to dye away in each other, after the accuſtomed manner, ſometimes with a very pale blue, and ſometimes with *oaker* and *white*, and a little vermilion, ſoftening the whole together; the parts and the out-lines muſt be rounded off with the ſame colour.

The *mouth* muſt be almoſt a *purple*; but nevertheleſs you are to begin upon it with a little *vermilion*, *oaker* and *white*, and finiſh with *lake* and *blue*; and for the ſtronger ſtrokes, you muſt uſe *biſtre* and *lake*, which are us'd alſo for the eyes, the noſe, and the ears.

If it be a *crucifix*, &c. where there muſt be an appearance of blood; after the fleſh is finiſh'd, you muſt colour with *vermilion* and finiſh with *carmine*, ſwelling out the drops of blood, and giving them a roundneſs.

As for the crown of thorns, lay on *ſea-green* and *maſticote*, and ſhade with *biſtre* and *green*, and refreſh the lights with *maſticote*.

DEATH is repreſented by a skeleton, cover'd with a rich mantle, embroidered with gold, and his face covered with a fine mask.

The skeleton, *&c.* declares, that whilſt he ſtrips grandees of all that they have, he cures the afflicted of all their trouble; the fine mask, that he is gentle to ſome, terrible to others, indifferent to the couragious, and odious to cowards.

DEBT is repreſented in painting, by a melancholy young man, with a green bonnet on his head; a plate of iron upon both his legs, and about his neck; holding a basket in his mouth, and a ſcourge in his hand.

Melancholy, becauſe in debt; poor clothes, his finding no more credit; the green bonnet alludes to the cuſtom of ſome countries, where ſuch who are bankrupts, are forced to wear them; the ſcourge, becauſe debtors in *Rome* were whipped.

DECEIT is repreſented in painting, by a man cloathed with the skin of a goat; from the middle downwards are two ſerpents tails, in one hand fiſhhooks, in the other a net full of fiſh; a panther by him, with his head between his legs, which ſhews that fiſh are catched by deceiving them; and the panther, by hiding his head, and ſhewing his fine skin, is ſaid to intice other beaſts; and the two ſerpents tails, ſhew deceit.

DECEMBER is drawn with a horrid aſpect, clad in an *Iriſh* rug or coarſe frize girt about him; upon his head, three or four night caps, and over them a *Turkiſh* turbant; his noſe red, and his beard hung with iceſicles; at his back, a bundle of holly and ivy; having on his hands furred mittens, holding a goat.

DECENCY is repreſented in painting, &c. by a youth of a gentle aſpect, with a lion's skin on his back; in his right hand he holds a cube, in the middle of which is the cypher of *Mercury*; a branch of *amaranthus* in his left hand, with this motto, *Sic floret decoro decus*; his garment is embroidered with the ſame, and he wears it for a garland; on his right foot a buskin, on his left a ſock.

Handſome, becauſe decorum is the ornament of human life; genteel, becauſe always accompanied with decency; the lion's skin denotes the ſtrength of mind aſſigned to the obſervers of due decorum; the *amaranthus* denotes continuance, for that never withers, as the motto demonſtrates; the *Cothurnus* and *Soccus*, or buskin, denote decency in the geſture and behaviour; the firſt belonged to noblemen, the other to the inferior ſort.

DEFENCE is repreſented in painting, &c. by a young lady in armour, holding a naked ſword in her right hand; in her left, a target, and hedge hog in the middle.

Her youth denotes her fitneſs to defend her ſelf; the armour and ſword, both offenſive and defenſive actions; the hedge hog denotes defence, which upon any danger will roll itſelf in its prickly skin, bidding defiance.

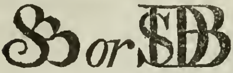
DEFENCE againſt ENEMIES is repreſented in painting, &c. by a lady, whoſe head-dreſs is ſet with precious ſtones; in her hands a ſquill, or ſea onion; a ferret at her feet, with rue in its mouth.

The precious ſtones denote charms againſt evil; the ſquill, they ſay, rubbed upon a gate, lets no evil come in; the ferret provides rue for its own defence, againſt the baſilisks, &c.

DEJECTION. See SORROW.

DELIGHT is repreſented in painting, &c. by a boy of ſixteen, with a pleaſant aſpect, in a green ſuit, adorn'd with various colours; a garland of roſes, a violin and its bow, a ſword, a book of *Ariſtotle*, one of muſick; two pigeons a kiſſing.

His countenance denotes delight; the green ſignifies the vivacity and delightfulneſs of green meadows to the ſight; the violin, delight in hearing; the book, delight in philoſophy; the doves, amorous delight.



STEPHEN DELLA BELLA of *Florence*, a famous and whimſical engraver, uſed theſe marks; his other mark is S B.

DEMOCRACY is repreſented in painting, *&c.* by a lady meanly dreſſed, with a garland of vine twiſted, with a branch of elm ſtanding upright; holding a pomegranate in one hand, and ſerpents in the other; ſome corn ſcattered upon the ground, and ſome in ſacks.

The garland denotes the union; the mean habit, the condition of the common people, that cannot equal thoſe that are higher, and therefore ſhe ſtands up; the pomegranate denotes a people aſſembled into one body, whoſe union is regulated according to their quality; the ſerpent union, but creeps, not daring to aſpire; the grain, the publick proviſion, cauſing union.

DEPART, is a method of refining or purifying gold by means of *aqua fortis.*

There are three different ways of refining gold: The *firſt* is by *antimony*, the *ſecond* by *ſublimate*, and the *third*, which is moſt uſual, by *aqua fortis.*

As to the operation of the DEPART; they take at the rate of one pound of pure gold, and two of ſilver; theſe they fuſe together in a crucible, and when fus'd, caſt them into cold water, where they become divided into grains of the bigneſs of peas.

Theſe grains being taken out and dry'd by the fire, are put into a *departing* veſſel, which is a ſtone matraſs, and to the metal is added four pounds of *aqua fortis.*

Then they take the veſſel and ſet it on coals, and in about the ſpace of an hour the refining is finiſhed; for upon opening the veſſel they find nothing therein but the *aqua fortis*, and the gold reduc'd into a *calx* or ſand; the ſilver being all diſſolv'd and imbib'd by the water.

To raiſe the gold to its due fineneſs, they uſually give it the *aqua fortis* again and again; uſing for the firſt time, half a pound, and for the ſecond, a quarter of a pound of the water to eight ounces of metal.

If the third water be found good and clear, the operation is finiſh'd; and the calx of the gold waſh'd in repeated water is melted down again in a crucible, firſt by a gentle, and after by a vehement fire, to be caſt into ingots or wedges.

It is to be obſerv'd, that the ſilver together with the impurities of the gold, are ſo thoroughly incorporated with the water, that there does not appear to the eye any thing but the pure liquid; yet is not this ſilver loſt.

In order to recover it again out of the *menſtruum*, they divide the ſtock of *aqua fortis* into ſeveral ſtone veſſels, which are fill'd up with ſpring water; obſerving to put ſeven or eight times as much of this as of that.

This being done a quantity of *copper* is put into each veſſel, and the whole is left for twenty four hours, at the end of which time the ſpirits of the *aqua fortis*, is found to have quitted the ſilver, and to have incorporated with the copper, leaving the ſilver in the form of a *calx* or aſhes at the bottom.

This *calx* being dry'd, is melted into an ingot with a little ſalt petre.

To be good husbands of the *aqua fortis*, and make it ſerve again for a ſecond operation, they diſtil it in an earthen or glaſs alembick, and when the diſtillation is about a third over, they change the recipient.

If the *aqua fortis* having quitted the *ſilver*, and being united with the copper be then filtrated, it is call'd *aqua ſecunda*. In which, if you ſteep an iron plate ſome hours, you will have another *Depart*. For the *menſtruum* will let go the copper and prey on the iron, leaving the copper in powder on the iron-plate.

And by filtrating this diſſolution, you may alſo get the *iron* out of it by laying in it a piece of *lapis calaminaris*; for the *iron* in that caſe will *depart* to the bottom and the *lapis* will be diſſolv'd.

And if you again filtrate this water, and pour on it the liquor of *fix'd nitre*, you will have another *Depart*; the *lapis* precipitating to the bottom.

And laſtly, filtrating this water as before, and evaporating it, you will have cryſtals of *ſalt-petre*.

WILLIAM DERYKE, was a hiſtory painter born at *Antwerp*, he was firſt bred a jeweller, but afterwards took to painting. He for many years drew hiſtory as big as the life in *England*, with tolerable ſucceſs in his works; there were many excellent parts of a boldneſs of pencil, whatever there might be wanting in grace and a pleaſing variety; he died about thirty three years ago, leaving behind him a daughter, whom he had inſtructed in this art.

DESIGN or draught is us'd to ſignify the thought, plan geometrical repreſentation, diſtribution and conſtruction of a *painting*, *building*, &c.

In building it may be call'd *ichnography*, when by *Deſign* is only meant the plan of a building, or a flat figure drawn on paper.

Or *orthography*, when ſome face or ſide of the building is rais'd from the ground.

And *ſcenography*, when both front and ſides are ſeen in perſpective.

DESIGN, is alſo particularly us'd in painting, for the firſt idea of a large work, drawn roughly, and in little, with an intention to be executed and finiſh'd in large.

In this ſimple ſenſe, the *Deſign* is the ſimple *contour* or outline of the figures or things intended to be repreſented; or the lines that terminate and circumſcribe them.

Such a *Deſign* is ſometimes drawn in crayons or ink, without any ſhadows at all, ſometimes it is *hatch'd*, that is the ſhadows are expreſs'd by ſenſible lines, uſually drawn acroſs each other, with the pen, crayon or graver.

Sometimes again, the ſhadows are done with the crayon rubb'd, ſo that no lines do appear at all; and ſometimes the grain or ſtrokes of the crayon appear as not being rubb'd.

Sometimes the *Deſign* is *waſh'd*, that is the ſhadows are done with a pencil in *Indian ink*, or ſome other liquor; and ſometimes the *Deſign* is *colour'd*, that is colours are laid on, much like thoſe intended for the grand work.

The qualities or parts requir'd in a *Deſign*, are correctneſs, *good taſte*, *elegance*, *character*, *diverſity*, *expreſſion*, *perſpective.*

Correctneſs depends principally upon the juſtneſs of the proportions, and a knowledge of anatomy.

Taſte is an idea or manner of *deſigning*, which ariſes either from the complexion or natural diſpoſition, or from education, the maſters, ſtudies, &c.

Elegance gives the figures a kind of delicacy, which ſtrikes people of judgment, and a certain agreeableneſs, which pleaſes every body.

The *character* is what is peculiar to each thing, in which there muſt be a *diverſity*, inaſmuch as every thing has its particular character to diſtinguiſh it.

The *expreſſion* is the repreſentation of an object, according to its character, and the ſeveral circumſtances it is ſuppos'd to be in.

The *perſpective* is the repreſentation of the parts of a painting or figure, according to the ſituation they are in, with reſpect to the point of ſight.

The *Deſign* or *Draught* is a part of the greateſt import, and extent in painting. It is acquir'd chiefly by habit and application, rules being of leſs avail here, than in any of the other branches of the art, as *colouring*, *clair obſcure*, *expreſſion*, &c.

The principal rules of deſigning are,

1. That young beginners accuſtom themſelves to copy after good originals at firſt ſight, not to uſe ſquares in drawing for fear of ſtinting and confining their judgment.

2. To ſtay till they can *Deſign* well after the *life*, before they begin the practice of perſpective rules.

3. In *deſigning* after the life, to learn to adjuſt the bigneſs of their figures to the viſual angle, and the diſtance of the eye from the model or object.

4. To mark out all the parts of their *Deſign*, before they begin to ſhadow.

5. To make their contours in great pieces, without taking notice of the little muſcles and other breaks.

6. To make themſelves maſters of the rules of perſpective.

7. To obſerve every ſtroke as to its perpendicular parallel and diſtance, and particularly ſo to compare and oppoſe the parts, which meet upon and traverſe the perpendicular, ſo as to form a kind of ſquare in the mind; which is the great, and almoſt the only rule of *deſigning* juſtly.

8. To have a regard not only to the model, but alſo to the part already *deſign'd*, there not being any ſuch thing as *deſigning* with ſtrict juſtneſs; but by comparing and proportioning every part to the firſt.

The reſt have a relation to perſpective, as

1. That thoſe objects whoſe rays meet in a point are ſeen at one view.

2. That the eye and object be always conceiv'd as immoveable.

3. That the ſpace or *medium* between, be conceiv'd to be tranſparent.

4. That the eye, object and picture be at a juſt diſtance, which is uſually double the bigneſs of the ſubject or picture.

DESIGNING, is the art delineating or drawing the appearance of natural objects by lines on a plane.

To *Deſign* according to the rules of mathematicks, makes the ſubject of perſpective. See PERSPECTIVE.

To *Deſign* by the *camera obſcura*. See CAMERA OBSCURA.

A mechanical method of DESIGNING *objects.* Provide a ſquare piece of glaſs fitted into a frame A B C D, (tab. perſp. fig. 9.)

And waſh or ſmear it over with water, wherein a little gum has been diſſolv'd.

And when it is well dry'd again, turn it towards the object or objects to be *deſign'd*, ſo as that the whole thereof may be ſeen through a *dioptra* or ſight G H, fixt thereto.

Then proceed to the work, and applying the eye to the ſight, with a pen and ink, draw every thing on the glaſs as you ſee it appear thereon.

Having finiſh'd the draught, lay a fair moiſt paper thereon, and preſſing it pretty hard down, the whole will be transferr'd from the glaſs to the paper.

This method is very eaſy and exact, and deſerves to be more us'd by painters. See the *Machine.*

DESIGNING is repreſented in painting, *&c.* by a ſtripling of a noble aſpect, with a garment of rich cloth, holding compaſſes in one hand, and a mirror in the other.

His aſpect ſhews, that all things made by art more or leſs handſome, according to the more or leſs *Deſigning*; the compaſſes, that *Deſigning* conſiſts in meaſuring, the glaſs denotes, that a good imagination is requiſite.

DESIRE is an agitation of the ſoul, caus'd by the ſpirits which diſpoſe it to the deſire of thoſe things, which ſeem agreeable to it, ſo we deſire not only the preſence of an abſent good; but the preſervation of the preſent.

Deſire has this peculiar to it, that it agitates the heart more violently than any other of the paſſions, and furniſhes more ſpirits to the brain; which paſs from thence into the muſcles, and render all the ſenſes more acute, and all the parts of the body more active.

If *love* be join'd to *deſire*, that may be repreſented in drawing, painting and ſtatuary, by the eye-brows preſs'd (or cloſe together) and advanced or forwards towards the eyes, which will be more open than ordinary, with the eye-ball in the middle enflam'd or full of fire; the noſtrils riſe up and are contracted or drawn cloſeſt towards the eyes, the mouth half open, the corners drawn back, and the tongue may appear upon the edge of the lips, the colour more enflam'd than in *love*, all theſe motions ſhewing the agitation of the ſoul caus'd by the ſpirits, which being in motion and diſpoſing it to *Deſire* a good repreſented as convenient for it, give a lively glowing colour.

Deſire may alſo be expreſs'd by the arms being extended towards the object deſir'd, and the whole body inclining the ſame way; and all the parts appearing in an unquiet and wavering motion.

DESPAIR, is an opinion of the impoſſibility to obtain what we deſire, and makes us loſe even what we poſſeſs.

Extreme Deſpair may be expreſs'd in *drawing*, *painting* and *ſtatuary*, by a man grinding his teeth, foaming and biting his lips, his forehead furrowed with wrinkles from the top to the bottom, the eye-brows drawn downwards over the eyes, and preſſing one another on the ſides of the noſe; the eyes ſeeming fiery and full of blood, the eye-ball diſturb'd or wandering, and hid under the eye-brow, the lower-part of the eye will ſeem ſparkling and unſteady, the eyelids ſwell'd and livid; the noſtrils large, open and riſing upwards, the end of the noſe ſinking down; the muſcles, tendons and veins of theſe parts being very much ſwell'd and ſtretch'd, as alſo all the veins and nerves of the forehead, temples, and the fore-parts of the viſage; the upper part of the cheeks will appear large, but ſcored and drawn in about the jaws; the mouth being drawn backwards, is more open at the ſides or corners than the middle; the under lip is large and turn'd out, the lips are pale as is the reſt of the face, and the hair ſtaring and ſtanding upright.

In *Deſpair* all the parts of the body are almoſt in the ſame ſtate as in *anger*, but they ſhould appear more diſorder'd; for you may expreſs one in this condition, tearing off his hair, biting and tearing his fleſh, or running and precipitating himſelf.

DESPISING PLEASURE is repreſented in painting, &c. by a man armed with a garland of laurel, going to fight, a ſerpent and a ſtork by his ſide; at his feet many ſerpents, which the ſtork fights with beak and claws.

Armed becauſe the deſpiſing thoſe things requires magnanimity, the ſtork fighting againſt the *Pleaſures* of the world; and earthly thoughts are intimated by the ſerpent, always creeping on the earth.

DESPISING *the* WORLD is repreſented in painting, &c. by a man armed, a palm branch in one hand, and a ſpear in the other; turning his head aſide towards heaven, he tramples upon a crown, which ſignifies his undervaluing riches and honours. His head denotes, that ſuch diſ-eſteem proceeds from ſanctified thoughts of God, his being armed intimates, that he attained not ſuch perfection without fighting.

DESTINIES, are the three ſiſters which the *Latins* call *Parcæ*, named *Clotho*, *Lacheſis* and *Atropos*.

Clotho is feign'd to have the charge of the births and nativities of mortals; *Lacheſis* of all the reſt of their life, and *Atropos* of their death or departure out of the world.

They are all three repreſented in painting, &c. ſitting on a row, very buſily employ'd in their ſeveral offices, the youngeſt ſiſter drawing out of a diſtaff a thread of a reaſonable bigneſs, the ſecond winding it about a wheel, and turning the ſame, till it becomes little and ſlender; the eldeſt (which is aged and decrepit) ſtands ready with a knife or ſhears to cut it off, when ſpun.

They are alſo painted in white veils, and little coronets on their heads wreathed about with garlands of flowers of *narciſſus*.

DESTINY, was alſo repreſented as a lady in a great rage or fury, and of exceeding celerity, holding in her hand an iron bow, ready bent, aiming to ſtrike *fortune* even at the very heart.

DETRACTION is repreſented in painting, &c. by a woman ſitting, lolling out her tongue, a black cloth over her head; her garment torn and ruſty coloured, ſpread here and there with tongues, a cord about her neck inſtead of a bracelet, in her right hand ſhe holds a dagger as if ſhe would ſtab.

Her ſitting denotes idleneſs, the main cauſe of *Detraction*, her mouth open, proneneſs to *Detraction*, and back-biting, the ruſty coloured garment, that as ruſt corrodes iron, ſo does *Detraction* the good name and reputation, the rope the abject condition of back-biters.

DEVICE, is an emblem or repreſentation of ſome natural body, with a motto or ſentence apply'd in a figurative ſenſe, to the advantage of ſome perſon, and the figure or image is call'd the body, and the motto the ſoul of the *Device*.

A *Device* is a ſort of a metaphor, repreſenting one object by another, wherewith it has ſome reſemblance.

So that a *Device* is only true, when it contains a metaphorical ſimilitude, and may itſelf be reduc'd into a compariſon.

Laſtly, a *Deviſe* is a metaphor painted and viſible, and that ſtrikes the eye.

All theſe circumſtances are requiſite to a *Device*, and without them a figure only makes a hieroglyphick, and the word only a diction or ſentence.

Fa. *Bohours* gives a clear and accurate explication of the word *Device*. A *Device* ſays he, is a compoſition or aſſemblage of figures drawn from nature and art, call'd the *body*, and of a few words adapted to the figure, and call'd the *ſoul*.

Such a compound we make uſe of to denote our thoughts or intentions by compariſon; for the eſſence of a *Device* conſiſts in a compariſon, taken from nature or art, and founded on a metaphor.

This he illuſtrates, in the following inſtance; a young nobleman of great courage and ambition, bore for his *Device* in the laſt carrauſſol at the court of *France*, a rocket mounted in the air with this motto in *Italian*, *poco duri purche m'inalzi*, i. e. I would laſt little, provided I might riſe high, which ſeems to hold forth the following diſcourſe; as the rocket riſes to a great pitch, though it only endures a little while; ſo I am not concern'd about living long, provided I attain to glory and eminence, which is a juſt compariſon.

Upon this foundation a *Device* is a painted metaphor, or rather an enigma inverted, for whereas enigma's repreſent nature or art, by the events of hiſtory, and the adventures of fables; a *Device* is a repreſentation of human qualities, by natural or artificial bodies. The *French* have diſtinguiſh'd themſelves in this way, eſpecially ſince the time of Cardinal *Mazarine*, who had a wonderful fancy for them.

The *Italians* have reduc'd the making *Devices* into an art, and laid down laws and rules for it. Some of the principal are,

1. That there be nothing monſtrous or extravagant in the figures, nothing contrary to the nature of things, or the common opinion of mankind.

2. That figures be not join'd, that have no affinity or relation to each other, the metaphor being to be founded upon ſomething real, and not on hazard or imagination; excepting ſome whimſical unions eſtabliſh'd in fables, which cuſtom and the authority of the poets have made paſs for natural.

3. That the human body be never taken into *Devices*.

4. That there be a ſort of unity in the figures, that make the body, it is not meant, that there muſt be only a ſimple figure; but that if there be ſeveral, they have a relation and ſubordination to each other; ſo that there be one principal figure on which the reſt depend.

5. Though ſtill the fewer figures there are in the body of the *Device*, and the leſs they are confus'd, the more perfect and elegant is the *Device*.

5. The motto which is to animate the figure muſt agree ſo accurately thereto, as that it could not ſerve for any other.

6. Nothing to be nam'd that appears to the eye, and which the bare inſpection may make known.

7. The motto not to have a complete ſenſe of itſelf, for being to make a compound with the figure, it muſt only be a part, and conſequently muſt not ſignify the whole. If the words alone have a complete ſignification, you havea full and diſtinct notion independently of the figure; whereas the ſignification ſhould reſult from both.

8. The ſhorter the motto, the more beautiful; and a ſuſpenſion of the ſenſe which leaves ſomething to gueſs, is one of the principal graces of the *Device*.

9. And laſtly, it is accounted a happineſs in a *Device*, where the words of a poet are apply'd in a ſenſe he never dream'd of, and yet ſo pertinently, that it ſhould ſeem, that they had been intended for the ſame.

D. F. ſtands for *Domenichino* of *Florence*.

D. H. ſtands for *David Hepſer*, the brother of *Lambert* and of *Jerome*, all three *German* engravers.

DIAGLYPHICE, is the art of engraving, cutting or otherwiſe working hollow or concave figures in metals; ſuch as ſeals, intaglia's, the matrices or coins for medals, *&c.*

DIALLING.

The deſcription of the CLINATORY *or* DECLINATORY.

The declinatory is made of a ſquare board, as A B C D in the figure, of a good thickneſs, and the larger the better, between two of the ſides is deſcrib'd on the centre A a *quadrant*, as E F divided into ninety equal parts or degrees, which are figured with 10, 20, 30 to 90; and then back again with the complements of the ſame numbers to 90; between the limb and the two ſemi-diameters, is made a round box into which a magnetical needle is fitted, and a card of the nautical compaſs, divided into nineties, beginning their numbers at the eaſt, weſt, north and ſouth points of the compaſs; from which points the oppoſite ſides of the clinatory receive their names of eaſt, weſt, north and ſouth. See plate 1. fig. 1.

But note, that the north point of the card muſt be placed ſo many degrees towards the eaſt or weſt ſides of the clinatory, as the needle varies from the true north points of the world, in the place where you make the *Dial*, which the workman who makes the clinatory will know how to fit.

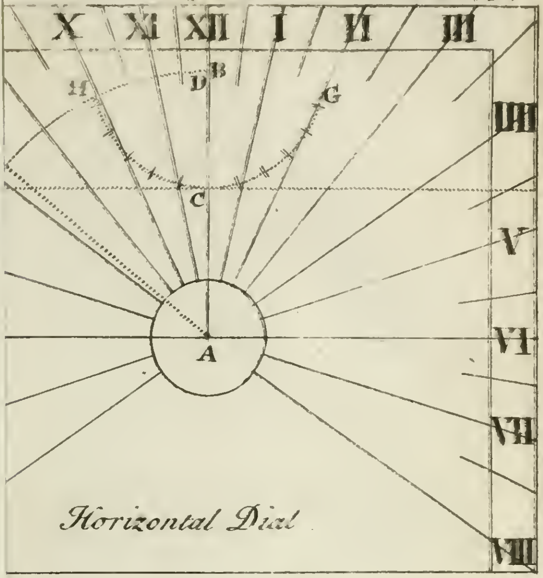
Upon the center, A, whereon the *quadrant* is deſcrib'd, is faſtened a plumb-line, having a plummet of lead or braſs, faſtened to the end of it, which plumb-line is of ſuch length, that the plummet may fall juſt into the grove G H, below the *quadrant*, which is for that purpoſe made of ſuch a depth, that the plummet may ride freely within it, without ſtopping at the ſides of it. See the figure annex'd.

With this clinatory you may examine the ſituation of planes, as if your plane be horizontal, it is direct; and then for the true ſituating your *Dial*, you have only the true north and ſouth line to find; which is done only by ſetting the clinatory flat down upon the plane, and turning it towards the right or left hand, till you can bring the north point of the needle to hang juſt over the *flower de luce*; for then if you draw a line by either of the ſides, parallel to the needle, that line ſhall be the north and ſouth line.

If your plane, either recline or incline, apply one of the ſides of the clinatory, parallel to one of the ſemi-diameters of the *quadrant* to the plane in ſuch a manner, that the plumb-line hanging at liberty, may fall upon the circumference of the *quadrant*; for then the number of degrees of the *quadrant*, comprehended between the ſide of the *quadrant*, parallel to the plane, and the plumb-line ſhall be the number of degrees

Fig. 2

Plate. IV.



Horizontal Dial

Fig. 4.

r South dial declining Eaſtward or Weſtward

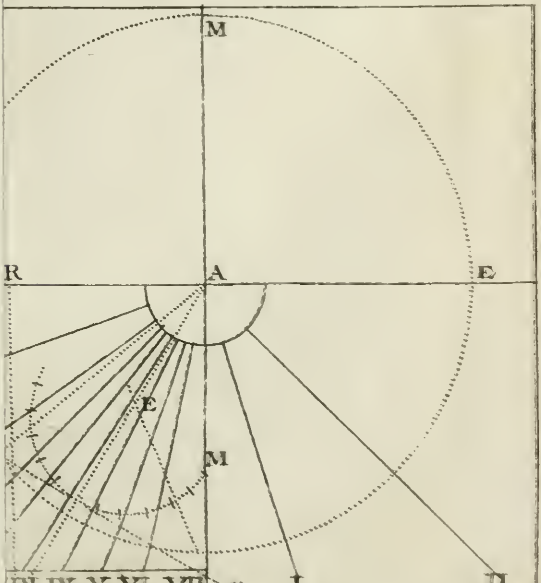


Plate. IV.

Fig 1.

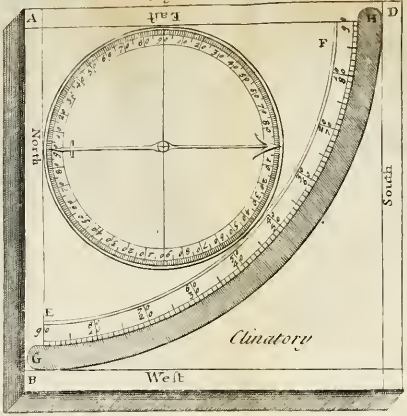

Clinatory

Fig. 2

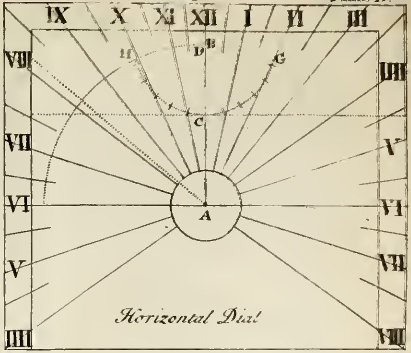

Horizontal Dial

Fig. 3.

An erect South Dial

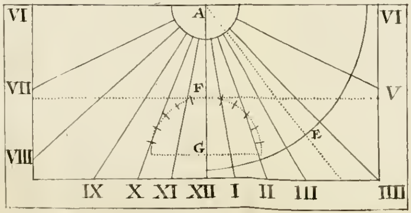
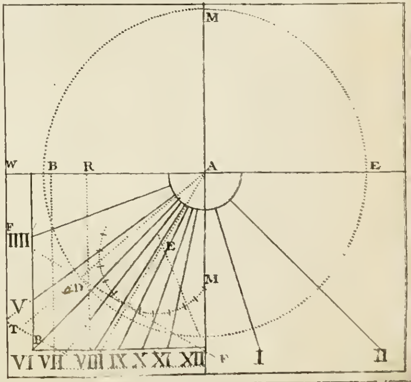


Fig. 4.

An Erect North or South dial declining Eastward or Westward



for *reclination*, if the center of the *quadrant* points upward; or *inclination* if the center points downwards.

If your *reclining* or *inclining* plane decline, draw upon it a line parallel to the horizon, which you may do by applying the back-ſide of the clinatory, and raiſing or depreſſing the centre of the *quadrant*, till the plumb-line hang upon one of the ſemidiameters; for then you muſt by the upper-ſide of the *clinatory*, draw an horizontal line if the plane *incline*, or by the under-ſide if it *recline.*

If it neither *incline* nor *recline*, you may draw a horizontal line both by the upper and under ſides of the clinatory.

Having drawn the horizontal line, apply the north ſide of the clinatory to it, and if the north end of the needle points directly towards the plane, it is then a *ſouth plane*; if the *north* point of the needle point directly from the plane, it is a *north plane*; but if it point directly towards the *eaſt*, it is an *eaſt plane*; if towards the *weſt*, a *weſt plane.*

If it do not point directly either *eaſt*, *weſt*, *north*, or *ſouth*, then ſo many degrees is the declination of the plane.

You may find a meridian line another way, thus; if the ſun ſhine juſt at noon, hold up a plumb line, ſo that the ſhadow of it may fall upon your plane, and that ſhadow ſhall be your *meridian line.*

To deſcribe a DIAL *upon a* HORIZONTAL *plane.*

Firſt draw a north and ſouth line (which is call'd a *meridian line*) through the middle of the plane, thus; ſet your *declinatory* flat upon the plane, and turn it to and fro till the needle hang preciſely over the *meridian line* of the *declinatory*; then by the ſide of the *declinatory*, parallel to its *meridian line*, draw a ſtrait line on the plane, and if that ſtrait line be in the middle of the plane, it ſhall be a *meridian line* without any more to do. See plate 1. fig. 2.

But if it be not in the middle of the plane, you muſt draw a line parallel to it, through the middle of the plane, for the *meridian line*, or XII a clock line, and it ſhall be the *meridian line*, and alſo the *ſubſtilar line*; then draw another ſtrait line through the middle of this line, to cut it at right angles, for the VI a clock lines; and where theſe two lines cut one another, make your center, whereon deſcribe a circle on your *plane*, as large as you can, which by the *meridian line*, and the line drawn at right angles with it, will be divided into four *quadrants*; one of the *quadrants* divide into ninety degrees, thus, keeping your compaſſes at the ſame width they were at, when you deſcrib'd the *quadrant*; place one foot in the XII a clock line, and extend the other in the *quadrant*, and make in the quadrant a mark with it; ſo you will have the ſixtieth degree mark'd out; then place one foot of your compaſſes in the VI a clock line, and extend the other in the *quadrant*, and make in the quadrant another mark with it; and ſo will that quadrant be divided into three equal parts, each of theſe three equal parts contains thirty degrees: then with your compaſſes divide one of theſe three equal parts into three parts, and transfer that diſtance to the other two third parts of the quadrant, ſo ſhall the whole *quadrant* be divided into nine equal parts.

Then divide one of theſe nine equal parts into two equal parts, and transfer that diſtance to the other eight equal parts, and ſo ſhall the *quadrant* be divided into eighteen equal parts.

Then divide one of theſe eighteen equal parts into five equal parts, and transfer that diſtance to the other ſeventeen equal parts, and ſo will the whole *quadrant* be divided into ninety equal parts. Each of theſe ninety equal parts are call'd degrees.

Note, That you may in ſmall *quadrants*, divide truer and with leſs trouble with ſteel dividers (which open or cloſe with a ſcrew for that purpoſe) than you can with compaſſes.

In this *quadrant* (thus divided) count from the ſubſtilar or *meridian-line*, the elevation of the pole, that is, the number of degrees that the *pole* of the world is elevated above the *horizon* of your place, and draw a line from the center through that number of degrees for the *ſtilar line*.

Then on the *ſubſtilar line* chuſe a point (where you pleaſe) and through that point draw a line at right angles to the *ſubſtilar line*, as long as you can, for the line of *contingence*; and from that point in the *ſubſtilar line*, meaſure the neareſt diſtance that any part of the ſtilar line hath to that point; and keeping one foot of your compaſſes ſtill in that point, ſet off that diſtance in the *ſubſtilar line*, and at that diſtance deſcribe againſt the line of contingence a ſemi-circle, which divide from either ſide the *meridian* or *ſubſtilar line* into ſix equal parts thus: draw a line through the center of this ſemi-circle, parallel to the *line of contingence*, which ſhall be the *diametral line*, and will divide this ſemi-circle into two *quadrants*; one on one ſide the *ſubſtilar line*, and the other *quadrant* on the other ſide the *ſubſtilar line*.

Then keeping your compaſſes at the ſame diſtance they were at, when you deſcribed the ſemi-circle, place one foot firſt on one ſide of the *diametral line*, at the interſection of it and the ſemi-circle, and then on the other ſide at the interſection of it and the ſemi-circle, and extend the other in the ſemi circle, and make marks in the ſemi-circle on either ſide the *ſubſtilar line*.

Then place one foot of your compaſſes at the interſection of the *ſemi-crcle* and the *ſubſtilar line*, and turn the other foot about on either ſide the ſemi-circle, and make marks on the ſemi-circle; and ſo will the ſemi-circle be divided into ſix equal parts.

Divide one of theſe equal parts into two equal parts and transfer that diſtance to the other five equal parts, ſo ſhall the whole ſemi-circle be divided into twelve equal parts.

Theſe twelve diviſions are to deſcribe the twelve hours of the day, between VI a clock in the morning, and VI a clock in the evening.

If you will have half hours, you may divide each of theſe twelve into two equal parts, as before: if you will have quarters, you may divide each of theſe twenty-four into two equal parts more as before.

For thus proportioning the diviſions in the ſemi-circle, you may proportion the diviſions and ſub-diviſions of hours upon *dial planes*; for a ſtrait ruler laid upon each of theſe diviſions, and on the centre of the ſemi-circle, will ſhew on the *line of contingence*, the ſeveral diſtances of all the hours and parts of hours on the *dial plane*; and ſtrait lines drawn from the centre of the *dial plane*, through the ſeveral diviſions on the *line of contingence*, ſhall be the ſeveral hour lines, and parts on the *dial plane*.

But an *horizontal Dial* in our latitude will admit of four hours more, *viz.* V VI in the morning, and VII VIII in the evening.

Therefore in the circle deſcrib'd on the *dial plane*, transfer the diſtance between VI and V, and VI and IV on the other ſide the VI *a clock line*; and transfer the diſtances between VI and VII, and VI and VIII on the other ſide the oppoſite VI *a clock* hour line, and from the center of the dial plane, draw lines through thoſe transferr'd diſtances for the hour lines before and after VI.

Then mark your hour lines with their reſpective numbers, the *ſubſtilar-line* in this *Dial* (as aforeſaid) is XII; from thence towards the right hand, mark every ſucceſſive hour line with I II III, *&c.* and from XII towards the left hand with XI X IX, *&c.*

The ſtile muſt be erected perpendicularly over the *ſubſtilar line*, ſo as to make an angle with the *dial plane*, equal to the *elevation* of the *pole* of your place.

Example.

Suppoſe you would draw a *Dial* upon a *horizontal plane* here at *London*; firſt draw the *meridian* (or north and ſouth line) as XII B, and croſs it in the middle with another line at right

angles,

angles, as VI VI, which is an eaſt and weſt line. Where theſe two lines cut each other as at A, make the centre, whereon deſcribe the ſemi-circle B VI VI; but one of the *quadrants*, *viz.* the *quadrant* from XII to VI towards the right hand, you muſt divide into ninety equal parts (as you were taught before) and make at 51½ degrees (which is the latitude of *London*) a mark, and laying a ſtrait ruler to the centre of the *plane*, and to this mark draw a line by the ſide of it for the *ſtilar line.*

Then on the *ſubſtilar line*, chuſe a point as at C, and thro' that point draw a line as long as you can perpendicularly to the eaſt and weſt line VI VI as E F (which is call'd the *line of contingence*, or *contingent line)* and where this *line of contingence* cuts the *ſubſtilar line*, place one foot of your compaſſes, and from thence meaſure the ſhorteſt diſtance between the point C and the *ſtilar line* on the *ſubſtilar line*, as at D; which point D ſhall be the centre, whereon with your compaſſes at the ſame width, you muſt deſcribe a ſemi-circle to repreſent a ſemi-circle of the *equinoctial.*

Divide this ſemi-circle into ſix equal parts, to each of which equal parts, and to the centre of the *equinoctial* ſemi-circle lay a ſtrait ruler, and where the ſtrait ruler cuts the *line of contingence*, make marks in the line of *contingence.*

Then lay a ſtrait ruler to the ſemi-circle of the *dial plane* and to each of the marks in the *line of contingence*, and by the ſide of it draw twelve ſtrait lines for the twelve fore and afternoon hour lines, *viz.* from VI in the morning, to VI in the evening.

Then in the *quadrant* VI B meaſure the diſtance between the VI a clock hour line, and the V a clock hour line, and transfer the ſame diſtance from the VI a clock line to VII and V on both ſides the VI a clock hour line; and through thoſe diſtances draw from the center of the plane the VII and V a clock hour lines, and meaſure the diſtance between the VI a clock hour line and the IV a clock hour line, and transfer the ſame diſtance from the VI a clock line to VIII and IV, and through thoſe diſtances draw from the centre of the plane the VIII a clock and IV a clock hour lines. See plate 1. fig. 2.

If you will have the half hours and quarters, or any other diviſion of hours, you muſt divide each ſix diviſions of the equinoctial into ſo many parts as you intend, and by a ſtrait ruler laid to the center of the equinoctial, and thoſe diviſions in the *equinoctial* circle make marks in the *line of contingence*, as you did before for the whole hour lines; and lines drawn from the center of the plane through thoſe marks, ſhall be the ſub-diviſions of the hours. But you muſt remember to make all the ſubdiviſions ſhort lines, and near the verge of the *dial plane*, that the hours and the parts of the hours may the more eaſily be diſtinguiſh'd, as you ſee in the figure.

Having drawn the hour lines, ſet the number of each hour line under it, as you ſee in the figure.

Laſt of all, fit a triangular iron, whoſe angular point being laid to the center of the *dial plane*, one ſide muſt agree with the *ſubſtilar line*, and its other ſide with the ſtilar line, and ſo is the *ſtile* made.

And this ſtile muſt be erected perpendicularly over the *ſubſtilar line* on the dial plane, and there fix it; then is your *Dial* finiſh'd.

To deſcribe an ERECT DIRECT SOUTH DIAL.

You may know an *erect direct ſouth plane*, by applying the north ſide of the *declinatory* to it; for then, if the north end of the needle hang directly over the north point of the card in the bottom of the box, it is a ſouth plane; but if it hang not directly over the north point of the card, it is not a direct *ſouth plane*; but declines either *eaſt* or *weſt*, and that contrary to the pointing of the needle *eaſterly* or *weſterly*, from the north point of the card; for if the north point of the needle points *eaſterly*, the *plane* declines from the ſouth towards the *weſt*; if it points *weſterly*, the *plane* declines from the *ſouth* towards the *eaſt*.

You may know if the *plane* be truly *erect* or upright, by applying one of the ſides A B or A D to it; for then, by holding the centre A upwards, ſo that the plumb line may play free in the groove, if the line falls upon 0, or 90, the plane is upright; but if it hang upon any of the intermediate degrees, it is not upright, but either inclines or reclines.

If you find that it inclines, apply the ſide A B to it, and ſee what number of degrees the plumb-line falls on; for that number of degrees, counted from the ſide A B, is the number of degrees of *inclination*.

If you find that the plane *reclines*, apply the ſide A D to it, and ſee what number of degrees the plumb line falls on; for that number of degrees, counted from the ſide A D, is the number of degrees of *reclination*.

Theſe rules being well underſtood, may ſerve for the finding the ſituation of all other planes.

But in order to make a *Dial* on this *plane*, you muſt firſt draw a *meridian line* through the middle of the plane, by applying a plumb line to the middle of it, till the plummet hang quietly before it; for then, if the plumb-line be black'd (for a white ground) or chalk'd (for a dark ground) and ſtrain'd as carpenters do their lines, you may with one ſtroke of the ſtring on the *plane* deſcribe the *meridian line*, as A XII in plate 1. fig. 3.

Then on the top of this *meridian line*, as at A, draw another line athwart it, to cut it at right angles, as VI VI, for an *eaſt* and *weſt* line.

At the meeting of theſe two lines at the top, make your centre, on which deſcribe a ſemi-circle on your plane, as large as you can, which by the *meridian line*, and the *eaſt* and *weſt line*, will be divided into two quadrants.

One of theſe *quadrants* divide into ninety degrees (as is before taught) and from the ſubſtilar line, count the compliment of the *elevation of the pole*, which (here at *London*, where the pole is elevated 51½ degrees) its complement to 90 is 38½ degrees, and there make a mark as at E.

Then on the *ſubſtilar-line* chuſe a point (where you pleaſe) as at F for the *line of contingence* to paſs through; which line of contingence draw as long as you can, ſo that it may cut the *ſubſtilar line* at right angles; and from the point F in the *ſubſtilar line*, meaſure the ſhorteſt diſtance between it and the *ſtilar line*; and keeping one foot of your compaſſes ſtill in the point F, transfer that diſtance into the *ſubſtilar line*, as at G; then on the point G deſcribe a ſemi-circle of the equinoctial againſt the *line of contingence*, which ſemi-circle divide into twelve equal parts (as is taught in the example of the *horizontal dial)* and by a ſtrait ruler laid to each of theſe diviſions, and to the centre of the ſemi-circle, make marks in the *line of contingence* by the ſide of the ruler; for ſtrait lines drawn from the center of the *dial plane*, through theſe marks in the *contingent line*, will be the twelve hour lines before and after noon.

Then mark your hour lines with their reſpective numbers; the *ſubſtilar* or *meridian line* is XII, from thence towards the right hand with I, II, III, *&c.* and from thence towards the left hand with XI, X, IX, *&c.*

The ſtile muſt be erected perpendicularly over the ſubſtilar line, ſo as to make an angle on the *dial plane* equal to the complement of the *elevation of the pole*, viz. 38½ degrees.

To make an ERECT DIRECT NORTH DIAL.

The *erect direct north Dial*, ſtile and all, is made by the ſame rules, changing upwards for downwards, and the left ſide for the right, that the *erect direct ſouth dial* is made.

For if the *erect direct ſouth Dial* be drawn on any tranſparent plane, as on glaſs, horn, or an oiled paper, and the horizontal line VI VI turned downwards, and the line VII mark'd with V, and the line VIII with IIII, and the line V with VII, and the line IIII with VIII; then you will have of it a *north erect dial.*

All the other hour lines in this *Dial* are uſeleſs, becauſe the ſun in our *latitude* ſhines on a north face the longeſt day, only before VI in the morning and after VI in the evening.

To deſcribe an ERECT DIRECT EAST DIAL.

Hang a plumb line a little above the place on the wall, where you intend to make your Dial, and wait till it hang quietly before the wall; then, if the line be rubbed with chalk (as the carpenters do) you may, by holding the end of the plummet line cloſe to the wall, and ſtraining it pretty ſtiff, ſtrike with it a ſtrait line, as carpenters do; this line will be a perpendicular, as A B. See plate 2. fig. 1.

Then chuſe a convenient point in this perpendicular as at C, for a center, whereon deſcribe an occult arch, as at D E; this arch muſt contain the number of degrees of the *elevation of the equinoctial*, counted between D and E, which in our latitude is 38½ or (which is all one) the complement of the *elevation of the pole.*

Therefore in a quadrant of the ſame *radius*, with the occult arch, meaſure 38½ degrees, and ſet them off in the plane from E to D; then from D to the center C in the perpendicular draw the prickt line D C; and this prickt line will repreſent the axis of the world.

Then croſs this line at right angles with the line C F, and draw it off from C to F, as long as you poſſibly can, and this line will be the *contingent line.*

Then chuſe a point in this *contingent line* as at VI, and draw a line through that point at right angles for the *ſubſtilar line*, as G VI H for the *ſubſtilar line*; then open your compaſſes to a convenient width as to (VI G) and pitching one foot in the point G, with the other foot deſcribe a ſemi-circle of the equinoctial againſt the *line of contingence*, which ſemi-circle divide from VI both ways into ſix equal parts, as you were taught by the *example* in the *horizontal Dial*; and laying a ſtrait ruler on the centre of this ſemi-circle of the *equinoctial*, and to each of thoſe equal parts, mark on the contingent line, where the ruler cuts it; for thoſe marks ſhall be the ſeveral points, from whence lines drawn parallel to the line C D, ſhall be the reſpective hour lines. See plate 2. fig. 1.

The reaſon why the *contingent line* is drawn from VI to F ſo much longer than from VI to C, is becauſe the hour lines from VI to XII are more in number towards noon, than they are from VI backwards towards IV; for this Dial will only ſhew the hours from a little before IV in the morning to almoſt noon; for juſt at noon, the ſhadow goes off the plane, as may be ſeen by applying a ſtrait ruler to the center of the equinoctial ſemi-circle G, and lay it to the point XII in the ſemi-circle; for then the ſtrait ruler will never cut the *line of contingence*, becauſe the *line of contingence* is parallel to the line G XII on the equinoctial circle; and lines parallel, tho' continued to never ſo great a length, never meet.

To theſe hour lines put figures, as you ſee plate 2 fig. 1.

The ſtile I K of this Dial, as well as of all others, muſt ſtand parallel to the *axis of the world*; and alſo parallel to the face of the *plane*, and parallel to all the hour lines, and ſtand directly over the *ſubſtilar* or VI a clock hour line, and that ſo high, as is the diſtance of the centre of the *equinoctial* ſemi-circle from the *contingent line*.

To deſcribe a DIAL *on an* ERECT DIRECT *weſt plane.*

An *erect direct weſt Dial* is the ſame in all reſpects with an *erect direct eaſt Dial*, only as the eaſt Dial ſhews the forenoon hours, ſo the weſt ſhews the afternoon hours.

Thus if the eaſt Dial were drawn on any tranſparent plane, as on glaſs, horn, or oil'd paper, on the one ſide will appear an *eaſt Dial*, and on the other ſide a weſt; only the numbers to the *hour lines* (as was ſaid before as to the *north Dial)* muſt be changed; for that which in the eaſt Dial is XI, in the weſt muſt be I; that which in the eaſt Dial is X, in the weſt muſt be II; that which in the eaſt Dial is IX, in the weſt muſt be III, *&c.* The ſtile is the ſame.

To deſcribe a DIAL *on an* ERECT *north or ſouth plane*, DECLINING *eaſtward or weſtward.* Plate 1. fig. 4.

Theſe four Dials, *viz.* the *erect north declining eaſtward*, the *erect north declining weſtward*, the *erect ſouth declining eaſtward*, and the *erect ſouth declining weſtward*, are all projected by the ſame rules; and therefore are in effect but one Dial, differently plac'd, as you will ſee hereafter.

Firſt, draw on your *plane* a ſtrait line, to repreſent the horizon of your place, and mark one end of it W, for *weſt*, and the other end E for eaſt.

Then chuſe a point in this horizontal line for a centre as at A, on which you may deſcribe a circle, to comprehend all theſe four Dials; draw a line as M, A, M, perpendicular to the *horizontal line* W E through the centre A for a *meridian line*, and on that centre deſcribe a circle, which by the two lines W, A, E, and M, A, M, will be divided into four *quadrants*, which will comprehend the four Dials aforeſaid; for if it be a *north declining weſt* you are to draw, the upper *quadrant* on the left hand ſerves your purpoſe; if a *ſouth declining weſt*, the ſame lines continued through the center A into the lower *quadrant* to the right hand ſerves your turn; if a *north declining eaſt*, the upper quadrant to the right hand ſerves your turn; or if a *ſouth declining eaſt*, the ſame lines continued through the centre A into the lower *quadrant* to the left hand, ſerves your turn; and you muſt draw the *declination complement of the poles*, *altitude*, *ſubſtile*, *ſtile*, and *hour lines* in it; but the hour lines muſt be differently mark'd, as you will ſee hereafter.

I ſhall only give you an example of one of theſe *Dials*, viz. a *ſouth declining eaſt*.

We will ſuppoſe you are to draw a *Dial* that declines from the *ſouth*, 50 degrees towards the *eaſt*; here being but one *Dial*, you need deſcribe but one *quadrant* of a circle. Plate 1. fig .4.

Set off in the lower *quadrant* W, A, M, 50 degrees from the *meridian line*, M towards W, and from the centre A draw a ſtrait line, through that mark in the *quadrant*, as D, A, which may be call'd the line of declination; then ſet off from the *meridian line* the *complement* of the *pole's elevation*, which in our latitude is 38½ degrees, and there draw another line from the centre to A P, which we will call the *polar line*.

Then take in the *horizontal line* a convenient portion of the *quadrant*, as A B, and from the point B draw a line parallel to the meridian line A M, and continue that line till it interſect the *polar line* as at P, from which point P draw a line parallel to W A as P C; then meaſure the diſtance of A B in the horizontal line, and ſet off that diſtance in the line of declination, as from A to D, and from that point of diſtance draw a line parallel to the meridian A M, through the *horizontal line* at R, and through the point D, and continue it through the line P C as at S, then laying a ſtrait ruler to the center A, and the interſection of the line P at S, draw the line A S for the *ſubſtile*.

Then upon the point S erect a line perpendicularly as S T; then meaſure the diſtance between R and D, and ſet that diſtance off from S to T; and from the centre to the point T draw the line A T for the ſtile or *Gnomon*; and the triangle S A T made of iron or braſs, and erected perpendicularly over the ſubſtile S A, ſhall by its upper ſide T A, caſt a ſhadow upon the hour of the day.

But you will ſay the hour lines muſt be drawn firſt, it is true; therefore to draw them you muſt chuſe a point in the *ſubſtile line*, where you think good, and through it draw the line F F as long as you can for the *line of contingence*; then with your compaſſes take the ſhorteſt diſtance between this point and the ſtile, and transfer that diſtance below the *line of contingence* on the *ſubſtile* as at Æ or A E, and with your compaſſes at that diſtance deſcribe on the centre Æ a circle to repreſent the *equinoctial*; then (as you were taught in the example of the *horizontal dial)* divide the ſemi-circle of the *equinoctial* into twelve equal parts, beginning at the point in the *equinoctial circle*, where a ſtrait line drawn from the centre of it to the interſection of the *line of contingence* with the *meridian line*, cuts the *equinoctial line*,

line, as here at the point G; then lay a ſtrait ruler to the centre of the *equinoctial circle*, and to every one of the diviſions in the ſemicircle, and mark where the ſtrait ruler cuts the *contingent line*; for ſtrait lines drawn from the centre A of the *Dial*, to thoſe ſeveral marks on the *contingent line* ſhall be the *hour lines*; and muſt be numbred from the *noon line* or *meridian* A M, backwards as XII XI X IX, &c. towards the left hand, ſo is your *Dial* finiſh'd.

This *Dial* drawn on any tranſparent matter, as glaſs, horn or oiled paper, ſhall on the other ſide the tranſparent matter become a *ſouth declining weſt* (ſtile and all) but then the I a clock hour line muſt be mark'd II, the XII XII, the XI a clock hour line I, X, II, IX, III, &c.

If you project it anew, you muſt deſcribe the *quadrant* M W, on the other ſide the *meridian line*, on the centre A from M to E, and then count (as before) the *declination*, *altitude* of the *poles*, *ſubſtile* and *ſtile* in the *quadrant*, beginning at M towards E, and work in all reſpects as in the *ſouth declining eaſt*; only number this *ſouth declining weſt*, as in the foregoing paragraph.

If you project a *north declining eaſt*, you muſt deſcribe the *quadrant* above the *horizontal line*, from M upwards towards E on your right hand, and count (as before the *declination*, *altitude*, *complement* of *pole*, *ſubſtile* and *ſtile* from the *meridian line*, and work as with the *ſouth declining eaſt*; it muſt be numbred from the *meridian line* M, towards the right hand with XI X IX VIII, &c.

If this *Dial* were drawn on a tranſparent matter, the other ſide would ſhew a *north declining weſt*, but if you will project it anew, you muſt deſcribe the *quadrant* above the *horizontal line*, from M upwards towards W, and count from the *meridian line* A M, the *declination*, *complement*, *altitude* of the *pole*, *ſubſtile* and *ſtile*, and work with them in all reſpects, as with the *ſouth declining eaſt*; but then the XI a clock hour line muſt be mark'd I, the X, II, the IX, III, &c.

To make a DIAL *on the* CIELING *of a room, where the direct beams of the ſun never come.*

Find ſome convenient place in the tranſum of a window, to place a ſmall round piece of looking-glaſs about the bigneſs of a groat, or leſs ſo as it may lie exactly horizontal.

The point in the middle of this glaſs we will mark A, and for diſtinction ſake will call it *nodus*. See plate 2. fig. 2.

Through this *nodus* you muſt draw a *meridian line* on the floor, thus hang a plumb-line in the window exactly over the *nodus*, and the ſhadow that the plumb-line caſts on the floor juſt at noon will be a *meridian line*; or you may find a *meridian line* otherwiſe by the *clinatory*.

Having drawn the *meridian line* on the floor, find a *meridian line* on the ceiling, thus; hold a plumb-line to the ceiling, over that end of the *meridian line* next the window; if the plummet hang not exactly on the *meridian line* on the floor, remove your hand on the cieling one way or other, as you ſee cauſe, till it do hang quietly juſt over it, and at the point where the plumb-line touches the cieling, make a mark, as at B; that mark B ſhall be directly over the *meridian line* on the floor. Then remove your plumb-line to the other end of the *meridian line* on the floor, and find a point on the cieling directly over it, as you did the former point, as at C, and through theſe two points B and C on the cieling ſtrain and ſtrike a line black'd with ſmall coal or any other colour (as carpenters do); and that line B C on the cieling ſhall be the *meridian line*, as well as that on the floor.

Then faſten a ſtring juſt on the *nodus*, and remove that ſtring forwards or backwards in the *meridian line* on the *cieling*, till it has the ſame elevation in the *quadrant* on the *clinatory* above the *horizon*, that the *equinoctial* has in your habitation, and thro' the point where the ſtring touches the *meridian line* on the cieling, ſhall a line be drawn at right angles with the *meridian* to repreſent the *equinoctial line*.

Thus in our latitude the elevation of the equator being 38½ degrees; I remove the ſtring faſtened to the *nodus* forwards or backwards in the *meridian line* of the cieling, till the plumb-line of the *quadrant* on the *clinatory*, when one of the ſides are apply'd to the ſtring, fall upon 38½ degrees; and then I find it touch the *meridian line* at D in the cieling, therefore at D I make a mark, and through this mark ſtrike the line D E (as before I did in the *meridian line)* to cut the *meridian line* at right angles; this line ſhall be the *equinoctial line*, and ſerve to denote the hour diſtances, as the *contingent* line does on other *Dials*, as you have often ſeen.

Then I place the center of the *quadrant* on the clinatory upon the *nodus*; ſo as the arch of the *quadrant* may be on the *eaſt* part of the *meridian line*, and under-prop it ſo, that the flat ſide of the *quadrant* may lie parallel to the ſtring, when it is ſtrained between the *nodus* and the *equinoctial*; and alſo ſo as the ſtring may lie on the ſemi-diameter of the *quadrant*, when it is held up to the *meridian line* on the cieling.

Then removing the ſtring the ſpace of 15 degrees in the *quadrant*, and extending it to the equator on the cieling, where the ſtring touches the equator, there ſhall be a point through which the I a clock hour line ſhall be drawn; and removing the ſtring yet 15 degrees further to the eaſtward in the ſemi-circle of poſition, and extending it alſo to the *equator*, where it touches the *equator*, there ſhall be a point through which the II a clock hour line ſhall be drawn, removing the ſtring yet 15 degrees further to the eaſtward in the ſemi-circle of poſition, and extending it to the *equator*; there ſhall be a point through which the III a clock hour line ſhall be drawn.

The like is to be done for all the other afternoon hours. So oft as the ſtring is remov'd through 15 degrees on the *quadrant*, ſo oft will it point out the afternoon diſtances in the *meridian line* on the cieling.

Having thus found out the points in the *equator*, through which the afternoon hour lines are to be drawn, you may find the forenoon hour diſtances alſo, the ſame way, *viz.* by removing the arch of the *quadrant* to the weſt ſide the *meridian*, as before it was plac'd on the *eaſt*, and bringing the ſtring to the ſeveral 15 degrees on the *weſt* ſide the *quadrant*; or otherwiſe, you need only to meaſure the diſtances of each hour's diſtance, found in the *equator* from the *meridian line* on the cieling; for the ſame number of hours from XII, have the ſame diſtance in the *equinoctial line* on the other ſide the *meridian*, both before and afternoon.

The XI a clock Hour diſtance is the ſame from the *meridian line*, with the I a clock diſtance on the other ſide the *meridian*; the X a clock diſtance the ſame with the II a clock diſtance; the IX with the III, &c. and thus the diſtances of all the hour lines are found out on the *equator*. See plate 2. fig. 2.

Now, if the centre of this *Dial* lay within doors, you might draw lines from the centre through theſe pricks in the *equator*, and thoſe lines ſhould be the hour lines, as in other *Dials*; but the centre of this *Dial* lies without doors in the air, and therefore not convenient for this purpoſe; ſo that for drawing the hour lines, you muſt conſider what angle every hour line in an *horizontal Dial* makes with the *meridian*; that is at what diſtance in degrees and minutes the hour lines of an *horizontal Dial* cut the *meridian*, which you may examine as by operation 2. for an angle equal to the complement of the ſame angle, muſt each reſpective hour line with the *equator* on the cieling have.

Thus upon the point mark'd for each hour diſtance in the equinoctial line on the cieling, deſcribe the arches I, II, III, IV, as in the figure, and finding the diſtance from the meridian of the hour lines of an horizontal Dial to be according to operat. 2. thus,

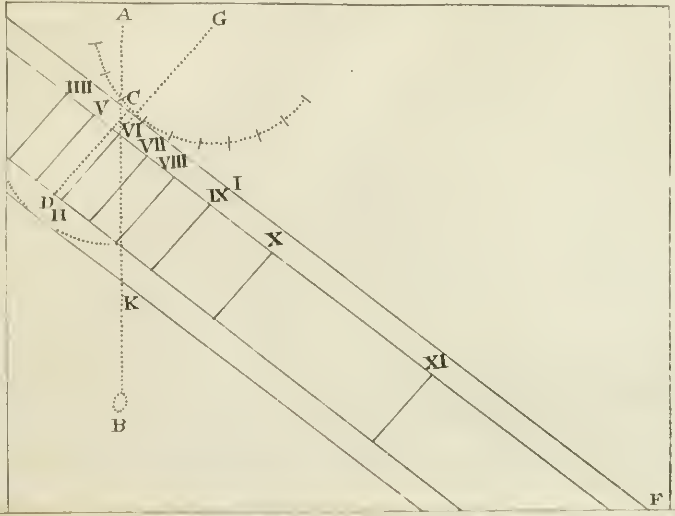
the	1	hour line	11,40	whoſe complement to 90 is	78,20
	2		24,15		65,45
	3		38,14		51,56
	4		53,36		36,24

I meaſure in a *quadrant* the ſame radius with thoſe arches already drawn from the *equinoctial line*.

Fo

Plate. V.

A Direct Eaſt Dial



A Plane ſcale or Quadrant for Dialling

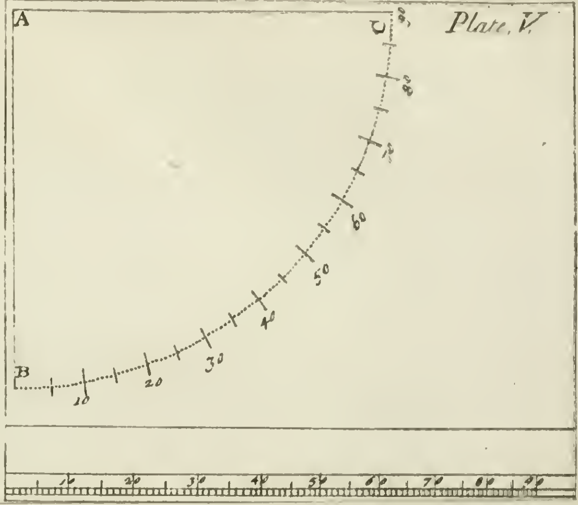
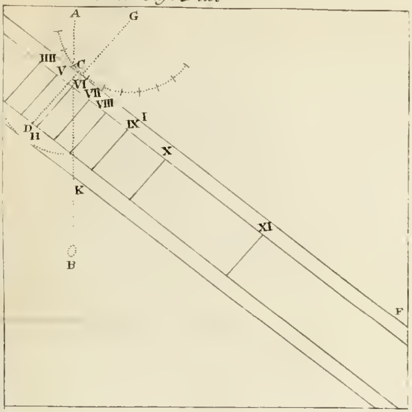
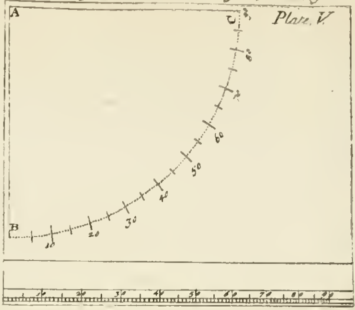


Plate. V.

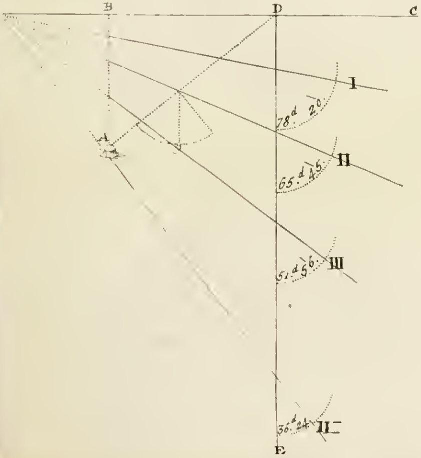
A Direct East Dial



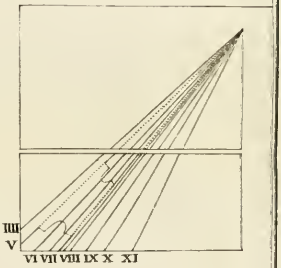
A Plane Scale or Quadrant for Dialling



Dial on the Ceiling of a Room, where the direct Rays of the Sun never come.



A Dial declining far Eastward or Westward



For the	1	a clock hour	78,20
	2		65,45
	3		51,56
	4		36,24

And transfer theſe diſtances to the arches drawn on the cieling; for then ſtrait lines drawn through the mark in the arch, and through the mark in the *equator*, and prolonged both ways to a convenient length, ſhall be the ſeveral hour lines (aforeſaid) and when the ſun ſhines upon the glaſs at *nodus*, its beams will reflect upon the hour of the day.

Some helps to a young DIALIST, *for his more orderly and quick making of* DIALS. See plate 2. fig. 3.

It may prove ſomething difficult to thoſe that are unpractiſed in *mathematical* projections, to divide a circle into 360 degrees (or which is all one) a ſemi-circle into 180, or a *quadrant* into 90 degrees.

The ſpeedieſt way of doing which, is by a line of chords, which if you will be curious in your practice, you may make yourſelf; or if you account it not worth your while, you may buy it already made on box or braſs of moſt *mathematical* inſtrument makers.

This inſtrument they call a plain ſcale, which does not only accommodate you with the diviſions of a *quadrant*; but alſo ſerves for a ruler to draw ſtrait lines with.

The manner of making it as follows:

Deſcribe upon a ſmooth, flat, even grain'd board a quarter of an whole circle, as B C, whoſe radius A B or A C, may be four inches, if you intend to make large *Dials* or two inches, if ſmall; but if you will you may have ſeveral lines of chords on your *ſcale* or *rule*.

Divide this *quadrant* into ninety equal parts, as you are taught in the making the *horizontal Dial.*

Then draw cloſe by the edge of your ſtrait ruler a line parallel to the edge, and at about 20 part of an inch a ſecond line parallel to that, and at about $\frac{1}{8}$ of an inch a third line, parallel to both.

Then place one foot of your compaſſes at the beginning of the firſt degree on the *quadrant* deſcrib'd, on the board, as at B, and open the other foot to the end of the firſt degree, and transfer that diſtance upon your rule from B to the firſt mark or diviſion, between the two firſt drawn lines.

Then place one foot of your compaſſes again at the beginning of the firſt degree on the *quadrant* deſcrib'd on the board, as at B, and open the other foot to the end of the ſecond degree, and transfer that diſtance upon your rule, from B to the ſecond mark or diviſion between the two firſt drawn lines; and thus meaſure the diſtance of every degree from the firſt degree deſcrib'd on the *quadrant*, and transfer it to the rule.

But for diſtinction ſake, you may draw every tenth diviſion from the firſt line parallel to the edge of the third line, and mark them in ſucceſſion from the beginning with 10, 20, 30, to 90; and the fifth diviſions you may draw half way, between the ſecond and third parallel lines; the ſingle diviſions only between the two firſt parallel lines. So is your line of chords made.

The uſe of the line of CHORDS.

As its uſe is very eaſy, ſo is its convenience very great, for placing one foot of the compaſſes at the firſt diviſion on the ſcale, and opening the other to the 60*th* degree, you may with the points of your compaſſes (ſo extended) deſcribe a circle, and the ſeveral diviſions on the ſcale ſhall be the degrees of the four *quadrants* of that circle, as you may try by working backwards, to what you were juſt now taught in the making the *ſcale*; for as before you meaſured the diſtance of the degrees of the *quadrant*, and transferr'd them to the *ſcale*; ſo now you only meaſure the diviſions on the *ſcale*, and transfer them to the *quadrant*, ſemi-circle, or whole circle deſcrib'd on your paper. For example.

If you would meaſure 30 degrees in your deſcrib'd circle, place on the foot of your compaſſes at the beginning of the diviſions on the ſcale, as at A, and extend the other foot to the diviſion mark'd 30, and that diſtance transferr'd to the circle, ſhall be the diſtance of 30 degrees in that circle.

Do the like for any other number of degrees.

You may draw your *Dial* firſt on a large ſheet of paper, if your *Dial* plane be ſo large, but if it is not ſo large, draw it on a ſmaller piece of paper; then rub the backſide of your paper *Dial* with ſmall-coal, till it be well black'd; and laying your paper *Dial* on the *Dial* plane, ſo that the lines of your paper agree with the *eaſt*, *weſt*, *north* and *ſouth* ſituation of your *Dial* plane.

Then with wax or pitch faſten the corners of the paper on the plane, and laying a ſtrait ruler on the hour lines of your *Dial*, draw with the blunted point of a needle, by the ſide of the ruler, and the ſmall coal rubb'd on the backſide the paper will leave a mark of the lines on the plane.

If you would have the lines drawn red, you may rub the backſide of your paper with vermilion; if *blue* with *verditer*, if yellow with *orpiment*, &c.

Then draw upon theſe mark'd lines with oil colours as you pleaſe.

If your *Dial* decline far towards the eaſt or weſt, the hour lines (unleſs projected to a very great length) will run very cloſe to one another; therefore in this caſe you muſt project your

Dial on a large table, or ſometimes on the floor of a room, and cut it off as far as you think good from the centre; for the further from the centre, the larger the diſtance of the hour lines. See plate 2. fig. 4.

Of PAINTING *ſun* DIALS, *and firſt of the planes on which* DIALS *are to be drawn.*

Dial planes are of two ſorts; firſt, ſuch as are made on the wall of a building; or ſecondly, ſuch as are drawn on tables of wood, vulgarly call'd *Dial* boards.

The firſt ſort, if they are made on brick-work, is done by plaiſtering on the wall with lime, ſand and hair, mix'd; this, if well drench'd with linſeed oil, after 'tis dry, or as long as it will drink in any; and then with oil and white-lead, may be durable enough.

But a better way is to temper the lime, ſand and hair with ox-blood, which will be no great charge, but of great advantage; for this mixture will equal in time the hardneſs of a free-ſtone, and keep the ſurface as free from the injuries of weather; but you muſt afterwards paint it white.

If you were to work on a ſtone, the beſt way is to drench the ſtone with linſeed oil and white very thin, till it will drink in no more; then ſhall the *Dial* you paint upon it, laſt longer and be the better prepar'd againſt the ruins of time.

Now for tables or *Dial boards* of wood, they being the moſt common, I ſhall give ſuch directions for making them, as have been always found moſt profitable and fit for the purpoſe.

The beſt woods for this purpoſe, are the cleareſt oak and the reddeſt firr, provided it be not turpentiny; there is not much difference between theſe two woods, as to their alteration by the weather; they being both ſubject to ſplit in caſe they are bound, and have not free liberty to ſhrink with dry weather, and ſwell with wet; though as to their laſting oak ſeems preferable, but good red fir will laſt the age of an ordinary man if well ſecured, as things of this nature ought to be.

In working either of theſe kinds of woods, the boards ought firſt to be cut to ſuch a length as you intend your *Dial* board ſhall be, and ſo many of them as may make up the breadth deſign'd, and let them be jointed on the edges, and placed on both ſides, and afterwards ſet to dry.

For it has been obſerv'd, that though boards have lain in a houſe ever ſo long, and are ever ſo dry, yet when they are thus ſhot and planed, they will ſhrink afterwards beyond belief, if kept dry.

When you think they are dry enough and will ſhrink no more, let them be ſhot again with good joints, and let every joint be ſecured with good dove-tails, let in croſs the joint in the backſide. Let this be done when the boards are glued together and well dry'd, After it has been thus glued, and the joints are ſufficiently dry, then let the face of the board be well planed and try'd every way, that it may be both ſmooth and true, and the edges ſhot true, and all of a thickneſs, as pannels of wainſcot are commonly wrought.

The edges muſt be thus true and even, that they may fit into the rabit of a moulding, put round it, juſt as a pannel of wainſcot does in its frame.

This will give liberty to the board to ſhrink and ſwell without tearing, whereas mouldings that are nailed round the edge as the common way is, does ſo reſtrain the motion of the wood, that it cannot ſhrink without tearing. But boards made this way will laſt a long time, without either parting in the joints or ſplitting in the wood.

Dials are ſometimes drawn on planes lin'd with copper or lead, that they may be free from ſplitting or tearing; but a board (made as before directed) is to be preferr'd in many reſpects. As firſt, in that it is much cheaper. Secondly, Both *lead* and *copper* too will ſwell a little with the heat of the ſun, and in time will grow hollow outwards, or convex inſtead of a perfect flat, which will much pervert the truth of its ſhadow. And thirdly, The colours will be apt to peel from the metal, and the *Dial* will by that means be in danger to be ſooner defac'd, than if it were painted upon a wooden plane.

How to make the beſt GLUE *for gluing the joints of* DIAL BOARDS. Take a quart of water, and ſet it on the fire, put into it about half a pound of good glue, and boil them gently together over a gentle fire, till the glue be wholly diſſolv'd, and of a due conſiſtence, that it may not be too thin; for if it be the wood will ſo drink it up that it will not be of a ſufficient body to bind the parts together; on the contrary, if it be too thick, it will not give way for the joint to ſhut cloſe enough to be ſtrongly join'd; for though 'tis glue that makes the joints ſtick, yet where there is ſo much of it, that the joint cannot cloſe exactly, 'twill never hold firmly.

Whenever you come to uſe glue, take care that it be firſt thoroughly hot, for glue that is not hot, never takes firm hold on the wood.

You muſt alſo take great care that the boards you are to glue have not been touch'd with oil or greaſe, for in ſuch places the glue will never take hold.

Although after a thing is once glued faſt, no greaſe nor oil can hurt it.

The glue being ready, and the joints of the boards ſhot true, ſet both the faces of the joint cloſe together, and both alſo turn'd upwards; then dip a bruſh in the glue and beſmear the faces of both joints, as quick as poſſible, then clap the two faces of the joint together, and ſlide or rub them long ways one upon another two or three times to ſettle them cloſe, and ſo let them ſtand till they are firm and dry.

Colours requiſite for PAINTING *a* SUN-DIAL. Four colours are ſufficient for this work, *viz. Spaniſh brown* for the firſt or priming colour.

2. White-lead for the ſecond colour, and finiſhing the face of the table.

3. *Vermilion* for drawing the hour lines.

4. *Lamp-black* for the figures in the margin, reſpecting the lines of every hour, if it be a *plane Dial.*

But if you would have your figures gilded, then ſome other materials are required, as *gold* and the ſize to lay it on, and ſmalt for a blue ground, if you intend a rich colour; but ſome lay the ground where the figures are gilt with *vermilion*, and that looks well, if the figures are lifted with black, and a black moulding round the *Dial.*

The practice of PAINTING *ſun* DIALS. When according to the rules before given, you have drawn on paper the draught of your *Dial*, and that your board be ready, and colours prepar'd, you muſt next proceed as follows.

Take *Spaniſh brown* that has been well ground and mix'd ſomewhat thin, and with a large briſtle bruſh dipt in it, colour the board or plane all over, both on the back as well as foreſide, to preſerve it the better, ſo that you leave no part uncoloured; this is call'd the priming of the *Dial.*

When this firſt colour is dry, do it over again with more of the ſame colour, tempered ſomewhat thicker, and when this is alſo dry, you may, if you pleaſe, do it over again with the ſame colour, your work will be the ſubſtantialler and laſt longer.

When this laſt time of colouring with your priming is dry, then colour the face of the plane over with white-lead, and when it is dry, do it over again three or four times more, ſucceſſively after each drying; and ſo will the face of your plane be ſufficiently defended againſt the fury and violence of the weather for many years.

When the laſt colouring of your white is dry, you muſt draw on your plane (with a *black-lead* pencil a horizontal line, as far diſtant from the uppermoſt edge of your *Dial*, as you ſhall think fit; then ſet out the margin of your *Dial* with boundary lines for the hour, half hour and quarter diviſions of your *Dial* (as you ſee is done in moſt *Dials).*

When this has been done, place the horizontal line of your paper draught on that which you before drew on the plane, placing the centre according as the ſituation of the plane for conveniency ſake requires.

If your *Dial* be a ſull or direct *ſouth Dial*, then let the centre be exactly in the middle of your plane; but if your *Dial* decline from the *ſouth* either *eaſt* or *weſt*, then place not the centre of the draught in the centre of the plane, but nearer to one ſide or other of it, according as it declines, having alſo reſpect to the quantity of its declination.

For example, if your *Dial* decline eaſtward, then let the centre of your draught be plac'd between the centre. and the eaſtern ſide of your plane; the quantity of which muſt be according to the declination of the *Dial*.

And if it declines much, place the centre of your draught the more out of the centre of your plane.

This muſt be done in order to gain a greater diſtance for thoſe hour lines, which in declining planes fall nearer together on one ſide, than they are in another.

And for far decliners, as thoſe of 70 or 80 degrees, they are frequently drawn without centres.

Having plac'd the paper draught on the plane, faſten it on with pins or tacks, then let the draught thereof be transferr'd to the plane by laying a ruler over every hour, half hour and quarter diviſion; and where your ruler ſhall cut or interſect the boundary lines of your margin; there make marks by drawing lines with a black-lead pencil of ſuch a length as each diviſion requires; obſerving to draw the hour and half hour lines quite through your margin, that they may be guides for the right placing of the figures; and for a ſmall ſpot that is uſually plac'd in the margin, right againſt the half hour.

Having thus transferr'd your draught on the plane, you muſt draw the ſubſtiler line, according as it lies in the draught, to be a guide for the right placing the ſtile or cock.

The draught being thus transferr'd on the plane, draw the boundary lines of the *Dial*, as alſo the hour, half hour and quarter diviſions with *vermilion* well ground in oil, make the colour as thick and ſtiff, as you can poſſibly work it, ſo as to draw a clear even line; becauſe this is to be done but once.

After you have drawn theſe lines with *vermilion*, make the figures with *lamp-black*, and a ſpot in the middle of the margin, right againſt the half hour line; and if you pleaſe you may in the margin at the top of your plane, put the date of the year, your name or ſome ſentence.

Then fit in your cock or ſtile, ſo as to make right angles with your plane, and then will your *Dial* be finiſh'd.

To gild with gold on an oily ſize either letters or figures in DIALS. Whatſoever you would gild muſt be firſt drawn with a gold ſize. (See the articles GOLD SIZE, and GILDING.) This you muſt let lie on, till it is ſufficiently dry to gild upon.

This is to be known by touching it with your finger, for if your finger ſtick a little to it, and the gold ſize do not come off, then it is dry enough; but if the colour come off on your finger, it is not dry enough, and then it muſt be let alone a little longer; for if you ſhould then lay on your gold, it would ſo drown it, that it would give no gloſs, and if the gold ſize be too dry, the leaf gold will not ſtick.

As for the manner of laying on the leaf gold. See the article GILDING.

After your gold is laid on, you may if you pleaſe, diaper or flouriſh upon it with thin burnt umber, ſo thin that gold may appear through it.

The way of painting a blue with SMALT. *Smalt* being a colour that gives its greateſt luſtre by ſtrewing, is to be perform'd as follows.

Firſt, Temper up *white-lead* pretty ſtiff with good clear drying oil, let it be as ſtiff as it well can be to ſpend well from the pencil, with this white colour; cover over the ſuperficies of the work, that is to be ſtrew'd with *ſmalt*, and if it be the margin of a *Dial* whoſe figures are already gilt with gold, let every part between the figures, and where there is no gold laid on be done over, and be very exact in the work, for the *Smalt* takes no where but on this new and moiſt ground; then ſtrew the *Smalt* thick on the part to be covered, and with the feather edge of a gooſe quill ſtroke it over, that it may lie even and alike thick on all places; and then with a bunch of linen cloth that is ſoft and pliable dab it down, that it may take well upon the ground; then ſtroke off the looſe colour with a feather, and blow off the remainder with a pair of bellows, and your work is finiſh'd.

DIAMOND, a precious ſtone; the firſt in rank, value, hardneſs and luſtre of all gems.

The goodneſs of *Diamonds* conſiſts in their water or colour, luſtre and weight; the moſt perfect colour is the white.

The defects of *Diamonds* are veins, flaws, ſpecks of red or black ſand, and a bluiſh or yellowiſh caſt.

The *European* lapidaries examine the goodneſs of rough *Diamonds*, their water, points, *&c.* by day light.

The *Indians* do it by night; in order to which, a hole is made in a wall a foot ſquare, and a lamp plac'd in it with a thick wick, by the light of which they judge of the ſtone, holding it in their fingers.

The water call'd *cæleſtis* is the worſt of all, and yet is ſomewhat difficult to diſcover in a rough *Diamond*.

The only infallible way is to examine it in the ſhade of ſome tufted tree.

Dr. *Wall* ſeems to have diſcovered an infallible method to diſtinguiſh *Diamonds* from other ſtones, which he gives as follows.

A Diamond with an eaſy, light friction in the dark, with any ſoft animal ſubſtance, as the finger, woollen, ſilk, &c. appears luminous in its whole body.

Nay, if you keep rubbing for ſome time, and then expoſe it to the eye, it will remain ſo for ſome time.

If when the ſun is eighteen degrees below the horizon, you hold up a piece of bays or flannel, ſtretcht tight between both hands, at ſome diſtance from the eye; and another rubbing the other ſide of the bays or flannel, pretty briskly with a *Diamond*, the light is much more vivid and pleaſant than any other way.

But that which he judges the moſt ſurprizing is, that a *Diamond* being expos'd to the open air in view of the sky, gives almoſt the ſame light of it ſelf without rubbing, as if rubb'd in a dark room; but if in the open air, you put the hand or any thing a little over it, to prevent its immediate communication with the sky, it gives no light; which is a diſtinguiſhing criterion of a *Diamond*.

A *rough* DIAMOND is one that is not yet cut, but juſt as it comes out of the mine.

A *facet* DIAMOND is one that is cut in faces both at the top and on the bottom, and whoſe table or principal face at the top is flat.

A *roſe* DIAMOND is one that is quite flat underneath, but its upper part cut in divers little faces, uſually triangles, the uppermoſt of which terminate in a point.

A *table* DIAMOND is one which has a large ſquare face at top, encompaſſed with four leſſer.

Diamonds are only found in the *Eaſt-Indies*, and that only in the Kingdom of *Golconda*, *Viſapour*, *Bengale*, and in the iſland *Borneo*.

There are four mines, or rather two mines and two rivers, from whence Diamonds are brought from. The mines are,

1. That of *Raolconda*, in the province of *Carnatica*, five days journey from *Golconda*, and eight from *Viſapour*. This has been diſcover'd about two hundred years and upwards.

2. That of *Gani* or *Couleur*, ſeven days journey from *Golconda* eaſtwardly. It was diſcover'd betweeen a hundred and twenty and a hundred and thirty years ſince by a peaſant, who digging in the ground, found a natural fragment of twenty-five caracts.

3. That of *Soumelpour*, a large town in the kingdom of *Bengale*, near the *Diamond* mine: this is the moſt antient of them

all. It ſhould rather be call'd that of *Goual*, which is the name of the river, in the ſand of which the ſtones are found.

4. The laſt mine, or rather the ſecond river, is that of *Succudan* in the iſland of *Borneo.*

The DIAMOND *mine of* Raolconda.

In the neighbourhood of this mine, the earth is ſandy, and full of rocks and copſe.

In theſe rocks are found ſeveral little veins of half and ſometimes a whole inch broad, out of which the miners, with a kind of hooked irons, draw the ſand or earth, in which the Diamonds are, breaking the rocks, when the vein terminates, that the track may be found again and continued.

When a ſufficient quantity of earth or ſand is drawn forth, they waſh it two or three times to ſeparate the ſtones from it.

The miners work quite naked, except a thin linen cloth before them; and beſides this precaution, have alſo inſpectors to prevent their concealing of ſtones; which however, notwithſtanding all this care, they frequently find means to do, by watching opportunities when they are not obſerv'd, and ſwallowing them down.

The DIAMOND *Mine of* Gani *or* Couleur.

In this *mine* are found a great number of ſtones, from ten to forty caracts, and even more; and it was here that famous Diamond of *Aureng-Zeb*, the Great Mogul, was found, which before it was cut, weigh'd 780 caracts.

The ſtones of this mine are not very clear, and their water is uſually ting'd with the quality of the ſoil, it being *black*, where that is marſhy; *red*, where it partakes of *red*; and ſometimes *green* and *yellow*, if the ground happen to be of thoſe colours.

Another defect of ſome conſequence is a kind of *Fat* appearing upon the *Diamond*, when cut, which takes off part of its luſtre.

There are commonly not leſs than 60000 perſons, men women and children at work in this mine.

When the miners have found a place, where they intend to dig, they level another ſomewhat bigger not far from it, and incloſe it with walls about two foot high, only leaving apertures from ſpace to ſpace, to give paſſage to the water.

After the performing a few ſuperſtitious ceremonies, and a kind of feaſt, which the maſter of the mine entertains the workmen with, to encourage them; they betake themſelves to their buſineſs, the men digging the earth in the place firſt diſcovered, and the women and children carrying it off into the wall round.

They dig twelve or fourteen foot deep, and till ſuch time as they find water.

Then they ceaſe digging, and the water thus found ſerves to waſh the earth two or three times, after which it is let out at the openings left for that purpoſe.

This earth being well waſh'd and well dry'd, they ſiſt it in a kind of open ſieve, or riddle; then they threſh it and ſiſt it again, ſearching it well with their hands to find the Diamonds. They work naked, as in the mine of *Raolconda*, and are watch'd in like manner by inſpectors.

The DIAMOND *mine of* Soumelpour, *or river of* Goual.

Soumelpour is a large town, built all of earth, and covered with branches of cacao trees; the river of *Goual* running by the foot of it, in its paſſing from the high mountain towards the ſouth to the *Ganges*, where it loſes its name.

It is from this river are brought all our fine *Diamond* points or ſparks call'd natural ſparks.

They never begin to ſeek for *Diamonds* in this river, till after the great rains are over, that is after the month of *December*; and they uſually even wait till the water is grown clear, which is not before *January*.

When the ſeaſon is come, eight or ten thouſand perſons of all ages and ſexes, come out of *Soumelpour*, and the neighbouring villages.

The moſt experienced among them ſearch and examine the ſand of the river, going up it from *Soumelpour* to the very mountains whence it ſprings.

A great ſign that there are *Diamonds* in it, is the finding thoſe ſtones, which we *Europeans* call *thunder ſtones.*

When all the ſand of the river, which at that time is very low, has been well examin'd, they proceed to take up that wherein they judge *Diamonds* likely to be found, which is done after the following manner: they dam the place round with ſtones, earth and faſcines, and lading out the water, dig about two foot deep; the ſand thus got, is carried into a place wall'd round on the bank of the river.

The reſt is perform'd after the manner as at *Coulcur*, and the workmen watch'd with equal ſtrictneſs.

The DIAMOND *mine in the iſland of* Borneo, *or river of* Succudan.

We are but little acquainted with this mine; the Queen who reigns in that part of the iſland, not allowing ſtrangers to have any commerce in theſe ſtones; though there are very fine ones to be bought at *Batavia*, which are brought thither by ſtealth.

They were antiently imagin'd to be ſofter than thoſe of the other mines; but experience ſhews, that they are in no reſpect inferior to them, Beſides theſe four *Diamond* mines, there have been two other diſcovered, one of them between *Couleur* and *Raolconda*, and the other in the province of *Carnatica*; but they were both clos'd up, almoſt as ſoon as diſcover'd: that of *Carnatica*, by reaſon that the water of the *Diamonds* was either *black* or *yellow*; and the other on account of their cracking and flying in pieces, when cut and ground.

The *Diamond*, as has been obſerv'd, is the hardeſt of all precious ſtones; it can only be cut and ground by it ſelf, and its own ſubſtance.

To bring it to that perfection, which augments its price ſo conſiderably, they begin by rubbing ſeveral againſt each other, while rough; after having well glued them to the ends of two ſticks or blocks, thick enough to be held in the hand. It is this powder thus rubb'd off the ſtones, and receiv'd in a little box for that purpoſe, that ſerves to grind and poliſh the ſtones.

Diamonds are cut and poliſh'd by means of a mill, which turns a wheel of ſoft iron, ſprinkled over with *Diamond* duſt, mixt with oil of olives.

The ſame duſt well ground and diluted with water and vinegar is us'd in the ſawing of Diamonds; which is perform'd with an iron or braſs wire as fine as a hair.

Sometimes inſtead of ſawing the *Diamonds*, they cleave them, eſpecially if there be any large ſhivers in them; but the *Europeans* are not daring enough to run the riſque of cleaving, for fear of breaking them.

A *rough Diamond* ought to be choſen uniform, of a good ſhape, tranſparent, not quite white, and free from flaws and ſhivers.

Black, rugged, dirty, flawy, veiny ſtones, and all ſuch as are not fit for cutting, are pounded in a ſteel mortar made for that purpoſe; and when they are reduc'd to a powder, they ſerve for ſawing, cutting, and poliſhing the reſt.

Shivers are caus'd in *Diamonds* by this, that the miners, to get them more eaſily out of the vein, which winds between two rocks, break the rocks with huge iron levers, which ſhakes and fills the ſtone with ſhivers.

The antients had two miſtaken notions as to the *Diamond*; the firſt is, that it becomes ſoft, by ſteeping it in hot goats blood; and the ſecond is, that it is malleable, and bears the hammer. Experience has ſhewn the contrary, there being nothing capable of mollifying the hardneſs of this ſtone; tho' its hardneſs be not ſuch that it will endure, being ſtruck at pleaſure with the hammer.

The fineſt *Diamonds* now in the world are that of the Great *Mogul*, weighing 279 caracts; that of the Great Duke of *Tuſcany*,

cany, weighing 139 caracts; and that known in *France* by the name of *grand ſancy*, which is one of the crown jewels, weighing 106 caracts; whence comes its name *ſancy*, which is a corruption of *cent ſix*, i. e. 106.

Tavernier, by a rule which he had made for eſtimating the value of Diamonds, computes that the Great Mogul's is worth 11000073238 *French* livres, equivalent to 879244 pounds ſterling; and that of the Duke of *Tuſcany*, 2618335 livres, or 195374 pounds ſterling.

The following is a rate, or manner of eſtimating the value of *Diamonds*, drawn up by a perſon exceedingly well vers'd in thoſe matters; and which for its curioſity, as well as the uſe it may be of, to perſons who deal in precious ſtones, we judge will be highly acceptable.

DIAMONDS *cut facet, or table-wiſe.*
Dutch cut.

	l.	*s.*		*l.*	*s. Sterl.*
A Diamond weighing 1 grain is worth.	1	00	to	1	1
1½	1	16	to	1	17
2	2	15	to	3	00
2½	3	12	to	3	15
3	4	15	to	5	00
4	7	17	to	8	00
5	15	00	to	15	15
6	22	00	to	25	00
7	30	00	to	34	00
8	42	00	to	45	00
9	60	00			
10	75	00			
12	112	00	to	120	00
15	187	00	to	220	00
19	330	00	to	380	00
24	450	00			
30	700	00	to	735	00
40	1500	00	to	1800	00
50	3500	00	to	4500	00
60	4500	00	to	5620	00

Antwerp cut.

	l.	*s.*		*l.*	*s.*
A Diamond weighing 1 grain is worth from	00	15	to	00	18
1½	1	6	to	1	10
2	2	2	to	2	5
3	3	12	to	3	15
4	6	00	to	6	7
5	10	10	to	11	5
6	13	10	to	15	00
7	18	15	to	22	10
8	24	00	to	26	00
9	33	15			
10	37	00	to	40	00
12	55	00	to	58	00
15	112	00	to	130	00
18	247	00			
24	315	00			
40	900	00	to	970	00
50	2200	00	to	2300	00
60	3500	00	to	4500	00

It muſt be obſerv'd however, that defects in the water or ſhape, red or black ſpots, ſhivers, and other failings frequently found in theſe ſtones, reduce the price by one third, and ſometimes more.

As to *brilliant* or *roſe* DIAMONDS, the price is always leſs by one third than table Diamonds, tho' the weight be the ſame; the reaſon is, that the latter ſhew themſelves a great deal more when ſet in their collets, than the former.

The *factitious* DIAMONDS made in *France*, call'd *temple Diamonds*, becauſe the beſt of them are made in the *temple* at *Paris*, are vaſtly ſhort of the genuine ones; and accordingly are but little valued, tho' the conſumption thereof is pretty conſiderable for the habits of the actors on the ſtage.

DIAMONDS, *the way of making artificial ones.*

To counterfeit DIAMONDS, *ſo as to endure the fire and harden them.* Take of good natural cryſtal, calcin'd and reduc'd to ſubtile powder, what quantity you pleaſe; fill a pot with it, and ſet it in a glaſs houſe furnace for twelve hours to be melted and purified; then drop the melted matter into cold water, then dry it, and reduce it again to powder; add to that powder its weight of fine ſalt of *tartar*.

Mix theſe two powders well, and make little pills of them with common water.

Then wipe theſe pills, and put them into an earthen pot on a ſtrong fire there to grow red hot for twelve hours without melting.

Then put them into a pot in a glaſs-houſe furnace, where let them ſtand two days to be well melted and purified; then ſet the matter for twelve hours in the annealing furnace to cool gradually.

Afterwards break the crucible, and you will have a fine material for *Diamonds*, which muſt be cut and poliſh'd at the wheel.

Another way of making the DIAMOND *of* Alenſon. This way of making *Diamonds* is not quite ſo fine as the precedent, but has notwithſtanding ſeveral advantages which attend it; beſides it is more eaſy, ſince there only needs an ordinary fire to ſucceed in it.

Take an earthen glaz'd pot, ſet it on a little furnace; put in ſome filings of ſteel with ſome vine-aſhes at diſcretion, wherein place by one another cryſtals cut and poliſh'd; then pour common water gently on it, which warm and boil during the ſpace of twelve hours, taking care to add boiling water freſh into the veſſel, as it conſumes by boiling, and take care to keep it continually boiling.

Then examine if the *Cryſtals* have acquired the colour and hardneſs you expected; if they have not, continue the fire ſome hours longer, and they will be like the true Diamonds of *Alenſon*; but then they muſt be repoliſhed again at the wheel to give them colour and brightneſs.

To give the true colour and hardneſs of a DIAMOND *to* CRYSTALS *and* DIAMONDS *of* Alenſon. There are cryſtals and precious ſtones which have no natural hardneſs; which however may be given them by art, they having all the natural diſpoſitions thereunto required, ſince they have the ſame principle as the moſt fine, and that they only want a little ſulphur, which hindered their thorough coction.

Thus this defect may be obviated in precious ſtones, as well as metals, by giving them a due coction, and ſo changing them for the better.

The colour and hardneſs of Diamonds may be given to the cryſtals and *Diamonds* of *Alenſon*, by making a paſte of good *Dutch Tripoli*, with water out of a ſmith's forge; in which you muſt wrap up the cryſtals or Diamonds of *Alenſon*, being firſt cut and poliſhed; then put it into a crucible cover'd and luted, and ſet it on a gradual fire, where let it ſtand till the crucible becomes red hot.

A little while after, take out the ſtones, and poliſh them again at the wheel to give them their colour.

To ſet them in works, take *Indian* paper, with leaves of tin, like thoſe that are put behind looking glaſſes; then let them be ſet by ſome good goldſmith, and they can ſcarce be diſtinguiſh'd from fine ones, except by very nice diſcerners.

Another way to harden CRYSTALS *and* DIAMONDS *of* Alenſon.

CRYSTALS alſo acquire hardneſs in the paſte, we are now going to deſcribe, becauſe their humidity exhales, and they become more fixt.

Take barley-meal well ſifted, with *petroleum* or rock oil; then cut that paſte in the middle and put all the ſtones in order, ſo that they may not touch one another.

Then cover the ſtones with the other half of the paſte, put it into a crucible, covered with another, and luted well together and let it dry.

This being done ſet the crucible in a gradual wheel fire from five to ſix hours, a ſmall fire the two firſt hours, which increaſe from two to two hours, till the end of the ſix; then let the whole cool of itſelf.

When it is cold, break the crucibles, and you will find the ſtones very fine, ſhining and ſparkling like fine *Diamonds*, which poliſh again at the wheel, and let them be ſet by a skilful workman.

A method of hardening CRYSTALS *and* DIAMONDS *of* Alenſon, *and to make them ſparkle as much as natural oriental* DIAMONDS. Take one pound of a load-ſtone, a pound of quick-lime, and half a pound of common ſulphur; the whole reduc'd to powder, and well mix'd.

With this powder cement your *cryſtals* and *Diamonds* of *Alenſon* well cut, in a crucible, covered and luted well when the lute is dry, ſet the crucible in a glaſs-houſe furnace for three days; in a place where the matters may be continually red hot with fuſion. If you have not a furnace ready at hand for that purpoſe, take care not to take out the crucible all at once, but let it cool gently; otherwiſe there will be danger of the ſtones breaking.

Break the crucible, and you will find your ſtones very fine and ſhining, and which will reſemble *Diamonds* of the old rock.

Poliſh them again at the wheel, to give them a colour, and work them, and they can ſcarce be diſtinguiſh'd from true ones.

The way of turning white SAPPHIRE *into true* DIAMOND.

The white *ſapphire* being fine and fix'd, is only imperfect by reaſon of its wanting colour and hardneſs, which may be remedied by art, and be made to ſurpaſs nature; becauſe ſhe only would have made it a perfect *ſapphire*, but art can turn it into a true *Diamond.*

It is only fire can work this effect, in changing its natural colour, and giving it that of a *Diamond.*

Thus take very fine ſand, waſh it in ſeveral waters to cleanſe it, till the water become clear and then dry it.

Fill a crucible half full with this ſand, then put in your *ſapphire*, and fill it up with the ſame ſand.

Then cover your crucible with a cover of the ſame earth or with another crucible, lute the whole with a good lute, and lay it on an inch thick, and let it lie in the ſhade being dry, ſet it in a glaſs-houſe furnace, approaching it nearer to the fire by degrees, and leaving it twelve hours in the ſame degree of heat.

Then withdraw it by little and little for the ſpace of ſix hours, and let it cool gently. The crucible being cold, break it, and you will find therein your *ſapphire*, which will have all the qualities of a fine *Diamond*; that is its ſhining and hardneſs. Poliſh it again at the wheel, and work it.

Another way of turning white SAPPHIRE *into a true* DIAMOND.

This will be eaſier to thoſe, who have not the conveniency of a glaſs-houſe furnace, for it may be done with a wind furnace in twelve hours time.

You muſt wrap up your white *ſapphire* in a thin iron plate, that it may be eaſily manag'd.

Then take fine gold purified by *antimony* to the higheſt, put it in a crucible in a wind furnace, melt it, and when it has a good fine gloſs, put the *ſapphire* covered with the iron plate into the bath, ſo that it may float on the gold on every ſide; then give it a ſtrong fire for twelve hours, ſo that the gold may be all the while in fuſion.

Take out the *ſapphire* with a little pair of tongs, ſhaking out the gold that may chance to ſtick in the leaf-iron; then let it cool by the fire gently for fear it ſhould break.

When it is cold, take away the plate of leaf-iron, and you'll have your *ſapphire* of an admirable beauty, it having acquir'd by that coction all the qualities and perfections of the natural *Diamonds.* Poliſh it at the wheel, and work it.

Another way to turn the white ſapphire *into a true* DIAMOND.

Take filings of iron or ſteel, put them in a crucible, then put in your white *ſapphire*, ſo that it may be wholly covered with the filings; ſet the crucible in the furnace, and give it a good fire, that the filings may be red hot without melting.

After it has been ſome time in the fire, take it out with a little pair of tongs, to examine if it be of the colour of a *Diamond*; put it into the filings again, and repeat this till it is perfect.

You may do the ſame thing with filings of ſteel, and an equal part of white enamel in powder.

Having well mixt them together, put them in a crucible, and put your *ſapphire* in the middle of them; after having firſt paſted them with the powder of enamel wetted with ſpittle, and well dry'd at the fire.

When the matter is red, and has remained ſome time in that condition, take out the *ſapphire* with the tongs, to ſee if it has taken the colour of a *Diamond*, if it has not, put it in again as before, and continue to do this till it is perfect. Then poliſh and work it.

DIAMONDS are repreſented [in miniature] by laying them quite *black*, and heightening with gentle touches of *white* on the light-ſide.

DIANA, who was alſo call'd *Cynthia*, *Lucina* and *Luna*, was, according to *Propertius*, repreſented in painting, *&c.* in the likeneſs of a young beautiful virgin; having on each ſide of her forehead two glittering horns, newly putting forth; drawn through the air in a purple coloured coach, by two ſwift pac'd horſes; the one of a *ſad colour*, and the other a *white*.

Boccace ſays, that the two different horſes intimate, that ſhe hath power both in the day and night.

Claudian ſays, that her chariot was repreſented drawn by two white bullocks (which image the *Egyptians* worſhipped with great zeal and reverence) having one of their flanks beſpotted with divers ſtars, and on their heads two ſuch ſharp horns as the moon has in her chiefeſt wane.

Cicero deſcribes the ſtatue of *Diana* (which he brought out of a temple in *Cilicia)* of a wonderful height and large dimenſion, the whole body cover'd with a large thin veil, of a youthful aſpect, holding in her right hand a lively burning torch, and in her left an ivory bow, with a quiver of ſilver headed arrows hanging at her back.

The poets who call her the goddeſs of hunting, and the imperial governeſs of woods and groves, deſcribe her in the habit of a young nymph, with her bow ready bent, in her hand a quiver of arrows hanging by her left ſide; a ſwift pac'd greyhound faſt tied to her right ſide with a collar about his neck, and troops of *ſylvan* virgins following her, which are chaſte and call'd the *nymphs* of *Diana*.

Pauſanias tells us, that there was a ſtatue of *Diana* in *Arcadia*, covered with the skin of a hind, and a quiver of arrows hanging from her ſhoulders, holding in one hand a burning lamp, the other leaning upon the heads of two ſerpents and before her feet a hound.

The *Egyptians* are ſuppos'd to have worſhipped her under the name of *Iſis*, and repreſented her in painting, covered with a black and ſable veſtment, in token that ſhe herſelf gives no light, holding in one hand a cymbal, and in the other an earthen veſſel of water, upon which, as *Servius* ſays, many thought her to be the genius of *Egypt*.

By the cymbal is intimated the murmurings and roarings of *Nilus*, when it overflows *Egypt*; and by the earthen veſſel the nature of the country, which is moiſt and full of lakes, pools and rivers.

She is alſo painted with yellow hair, a graſs-green mantle trimm'd with ſilver, ſilver buskins, golden bow and quiver of various colours.

The *nymphæ Dianæ* are depicted in white linen, to denote their virginity, and their garments girt about them, their arms and ſhoulders naked; bows in their hands and arrows by their ſides.

DIDO Queen of *Carthage*, is depicted in a purple or ſcarlet mantle, and her upper garments purple, with yellow hair, ty'd up with ſpangles and knots of gold, holding in her hand a golden quiver.

ABRAHAM DIEPENBEC, a ſcholar of *Peter Paul Rubens*, excell'd in hiſtory.

Lord Biſhop DIGBY, the reverend Lord Biſhop of *Elfin* in *Ireland*, may very well find a name in the account of *Engliſh* painters, ſince he has deſervedly raiſed one in that kingdom, where he arrived to be a ſpiritual peer. His limnings have much of beauty and boldneſs of draught in them, and are to a great degree elaborate with a due regard to a graceful part of nature; he is a ſingle inſtance of any perſon of that robe, that has made ſo conſiderable a progreſs in this art, as to be voted a maſter either in that kingdom or this, how common ſoever it is in other nations for the clergy to apply themſelves to painting.

DIGNITY is repreſented in painting, *&c.* by a woman richly adorn'd, but ſinking under the burthen of a huge ſtone, enchac'd within a border of gold and precious ſtones; her load expreſſes dignity, becauſe that proceeding from the care of publick affairs, is a very heavy burthen and hard to be ſupported.

ADRIAN VAN DIEST, was a famous landſcape painter born at the *Hague*, but whom we may very well term an *Engliſh* painter, being brought up here from his youth; he was chiefly inſtructed by his father, who commonly drew ſea-pieces, but that which contributed moſt to make the ſon a maſter, as he often owned, was drawing after thoſe noble views of *Eng-*

land in the weſtern parts and along our coaſts. He alſo drew many of the ruined caſtles in *Devonſhire* and *Cornwall*, being encouraged by that noble peer the Earl of *Bath* at his ſeat in thoſe parts. This painter's diſtances have a peculiar tenderneſs, and his clouds a freedom that few have arrived at.

DILIGENCE is repreſented in painting, *&c.* by a woman of a lively aſpect, with a ſprig of thyme in one hand, and a bee buzzing about it; in the other a bundle of almond and mulberry leaves, and a cock at her feet ſcraping.

The bee repreſents *Diligence*, by ſucking a pleaſant juice out of a dry herb, the almond and mulberry leaves, the middle way between haſtineſs and ſlowneſs in buſineſs; the firſt flouriſhing very early, and the other very late; the cock by his ſcraping denotes that he riſing betimes, can diſcern a barley corn from dung.

DIOPTRICKS, is properly the third branch of opticks; its office being to conſider, and explain the effects of light refracted, by paſſing through different *mediums*, as *air*, *water*, *glaſs*, &c. and eſpecially *lens's*.

DIRECT *viſion* in opticks, ſignifies that perform'd by *direct* rays, in contradiſtinction to *viſion* by refracted or reflected rays.

DIRECT *rays* are thoſe which paſs in right lines from the luminary to the eye, without being turn'd out of their rectilinear direction by any intermediate body, either opake or pellucid.

DISCRETION is repreſented in painting, *&c.* by an aged woman of a grave countenance, inclining her head to the left, lifting up her arm as a token of pity; with a plummet in one hand, and a camel by her ſide.

The plummet denotes *Diſcretion*, by adapting itſelf to human imperfections, and never deviates from itſelf, always juſt and perfect, the camel prudence, never carrying a burthen above its ſtrength.

DISPERSION, as point of *Diſperſion* in *dioptricks*, is a point from which refracted rays begin to diverge, when their refraction renders them divergent.

It is call'd the *point of Diſperſion* in oppoſition to the *point of concourſe*, which is the point wherein converging rays concur after refraction.

DISSIMULATION is repreſented in painting, *&c.* as a lady wearing a vizard of two faces, in a long robe of a changeable colour, and in her right hand a magpie.

A line of DISTANCE [in perſpective] is a right line drawn from the eye to the principal point.

Point of DISTANCE [in perſpective] is a point in the horizontal line at ſuch a diſtance from the principal point, as is that of the eye from the ſame.

DISTEMPER in *painting*, is a term us'd for the working up of colours with ſomething elſe beſides water or oil.

If the colours are prepar'd with *water*, that kind of *painting* is call'd *limning*, and if with oil it is call'd *painting in oil*, and ſimply *painting*.

If the colours are mixt with ſize, whites of eggs or any ſuch proper glutinous or unctuous ſubſtance, and not with oil, they then ſay it is done in *Diſtemper*, as the admirable cartoons at *Hampton-Court* are.

DISTEMPER. *The painting in* Diſtemper.

Before a *Fleming* nam'd *John Van Eyck*, but better known by the name of *John* of *Bruges*, found out the art of *painting in oil*, all painters work'd in nothing but *Freſco*, *Temper* and *Diſtemper*, as it is commonly call'd, whether it were on walls or boards, or any where elſe.

When they painted on boards, they often paſted on ſome fine cloth with good paſte to hinder them from parting; they then laid on a *layer of white*, after this they tempered their *colours* with water and paſte, or rather water and yolks of eggs beat together with little fig-tree branches; the milk of which mixing with the eggs, with this mixture they painted their pictures.

All *colours* are proper in this ſort of work, except the white of *lime*, which is never us'd but in *freſco*.

Azure and *ultramarine* muſt be us'd with a paſte made of *glove-skin* or *parchment*, for the yolks of eggs will make the *blue colours* turn *green*; which they do not with paſte nor gum, neither on walls nor boards.

If the work is on walls, care muſt be taken that they be dry: the painters muſt even lay on two *layers* of paſte quite hot, before he applies the colours, which if he pleaſes, he may alſo temper with *paſte*; for that compoſition of eggs and the fig-tree branches, is only to touch the work over again the more conveniently; and that he might not be oblig'd to uſe fire, which is neceſſary to keep the paſte hot.

However, it is certain, that the colours with paſte keep better.

And thus have all the *deſigns* or *cartoons* for tapeſtry been painted on paper. This paſte, as has been ſaid, is made of *glove-skin* or *parchment*.

When a painter would work upon cloth, he muſt chuſe that which is old, half us'd and very ſmooth; then preſs pounded plaiſter with *glove-skin paſte*, and lay it over and when that compoſition is dry, put another *layer* of the ſame *paſte* over it.

All the *colours* are pounded with water, each by itſelf, and as the painter wants them for his work, he tempers them with *paſte-water*; or if he will only make uſe of the yolks of eggs, he takes water to which he puts one glaſs of vinegar to the ſame quantity of water, the yolk, white and ſhell of an egg, with ſome ends of fig-tree branches, cut into ſmall pieces, and beats them well together in an earthen pan.

If he would varniſh the picture when 'tis finiſh'd, he need only rub it with the white of an egg well beaten, and then put one layer of varniſh over it; but this is ſeldom done, unleſs it is to preſerve it from water, for the greateſt diſadvantage of *Diſtemper* is that it has no glittering, and all its colours look dead; by which means they appear alike in all ſorts of *lights*, which *oil colours* or colours in *Diſtemper*, when varniſh'd do not.

DIVERGENT } *lines* [in geometry] are ſuch whoſe diſtance
DIVERGING } is continually increaſing.

Lines which converge one way, *diverge* the oppoſite way.

DIVERGENT } [in *opticks*] is particularly apply'd to rays,
DIVERGING } which iſſuing from a radiant point, or having in their paſſage undergone are fraction or reflection, do continually recede further from each other.

In which ſenſe the word ſtands in oppoſition to *convergent*, which ſignifies that the rays approach each other, or that they tend to a centre, where being arriv'd, they interſect, and if continued further, become diverging.

Concave glaſſes render the rays diverging, and convex ones converging.

Concave mirrors make the rays *converge*, and convex ones *diverge*.

DIVINITY is repreſented in painting, *&c.* by a lady all in white, with a flame on the crown of her head, and a blue globe alſo flaming in each hand.

The white ſignifies the purity of the Trinity, the object of the ſtudy of a divine is expreſt by the three flames; the globes denote eternity by the round figure inſeparable from the divine eſſence.

D. M. C. ſignifies *Dominico Maria Canuti*, a copious painter of *Bologna*.

DO. CAP. 1518. ſtands for *Dominico Campagnola* of *Venice*.

Mr. WILLIAM DOBSON born in the year 1610, imitated *Van Dyck*, liv'd at *London* and *Oxford*, excell'd in portraits, died in the year 1647, aged thirty ſeven years.

DOMINION is repreſented in painting, *&c.* by a man in a noble ſumptuous habit, his head ſurrounded with a ſerpent, a ſcepter in his left hand with an eye upon it; his arm extended and pointing with his fore-finger, as is uſual with thoſe who have *Dominion*.

The ſerpent was a notable ſign of *Dominion* amongſt the *Romans*, as is confirmed by the example of *Severus* and young *Maximinian*; both whoſe heads being ſurrounded with ſerpents, without offering them any harm, was a token of future grandeur; as for the eye, it ſignifieth the vigilance a great prince ought to have, who has an abſolute command over a people.

DOMINION OVER ONES SELF is repreſented in painting, &c. by a woman ſitting upon a lion, guiding the bridle, which he holds in his mouth with one hand, with the other pricks him.

The lion denotes the mind and its ſtrength, that reaſon ſhould curb the ſpirit if too briſk, and ſpur and prick it if too drouſy and dull; ſo that reaſon is a ray ſent from heaven to govern us in all our actions.

DRAPERY in painting and ſculpture, ſignifies the repreſentation of the garments or clothing of human figures; it alſo includes, not only the garments, but alſo hangings, tapeſtry, curtains, and moſt other things that are not carnations or landſcapes.

The art of *Drapery* conſiſts chiefly in three points, *viz.* the order of the folds or plaits, the different quality of the ſtuffs, and the variety of their colours.

1. As to the folds, they ought to be ſo managed, that you may eaſily perceive what it is that they cover, and diſtinguiſh it from any thing elſe; as for inſtance, that you ſee 'tis an *arm* that is under the drapery, and not a *leg*; or a *leg*, and not an *arm*, &c.

Again, the folds ought to be large, as breaking and dividing the ſight the leſs. There likewiſe ſhould be a contraſt between them, otherwiſe the drapery will be ſtiff.

2. The *quality of the ſtuffs* ſhould likewiſe be well conſidered; ſome cauſing their folds to be abrupt and harſh, and others more ſoft and eaſy.

3. Again, the ſurface of ſome have a luſtre, and others are flat and dead; ſome are fine and tranſparent, others firm and ſolid.

4. The *variety of colours*, when well managed, makes the greateſt beauty of painting; all not being equally amicable and friendly, with reſpect to each other; and ſome never to be plac'd near certain others. See COLOURING.

Mr. *de Piles* gives abundance of good obſervations as to *Drapery*.

He obſerves, that their firſt effect, and that which the painter ought to have principally in view is, that they expreſs the thing they are ſuppos'd to cover.

Plate. VI.

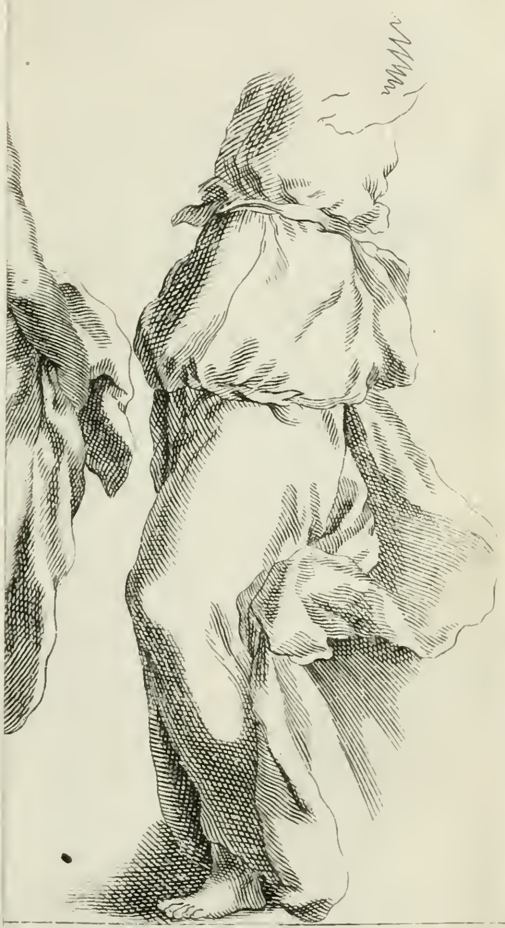
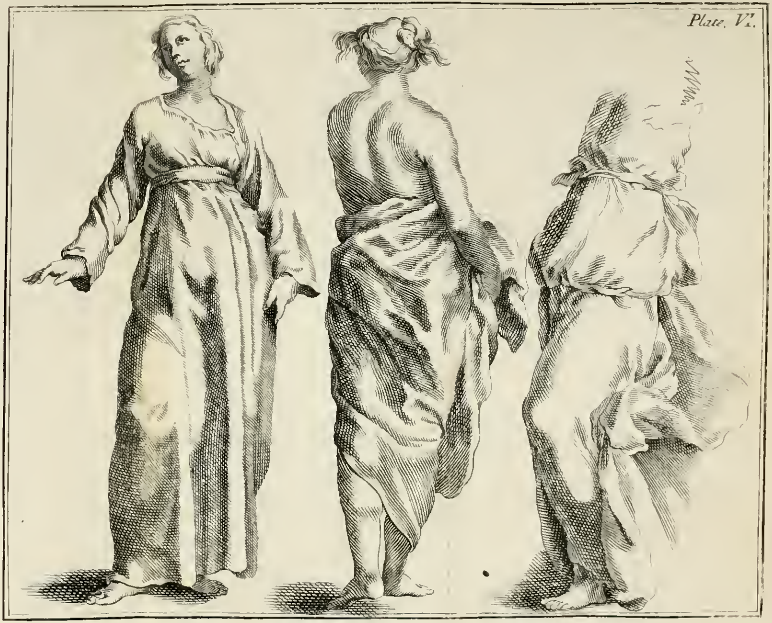


Plate. VI.



2. That they muſt never be made to adhere and ſtick to the parts of the body.

3. That a great lightneſs and motion of the *Drapery* are only proper in figures in great agitation or expos'd to the wind.

4. That the nudities of the figures ſhould always be deſign'd before the painter proceeds to the *Draperies.*

1. Draw the out-lines of garments lightly, and be very careful in it, for the whole grace of the picture lies in it; then draw the great folds firſt, and ſtroke thoſe into leſſer, and be ſure that they croſs not one another.

2. Suit the garments to the body, and make them bend with the body, according as it ſtands in or out, ſtrait or crooked, or turns one way or another; the cloſer the garment ſits to the body, the narrower and ſmaller muſt the folds be.

3. All the folds muſt conſiſt of two lines and no more, which you may turn with the garment at pleaſure, ſhadowing the inner deeper, the outermoſt more light; and if the folds be never ſo curiouſly contriv'd, ſpare not to ſhadow them (if they fall inward from the light) with a double or triple ſhadow, as the occaſion requires.

4. The out-lines muſt be continued through the whole garment, the leſſer you may break off and ſhorten as you pleaſe.

5. The ſhades in ſilk and fine linen are very thick and ſmall, which require little folds, and a light and rare ſhadow, commonly but double the moſt; and ſo alſo fine drapery requires more and ſharper folds than coarſe.

6. That part of a garment that ſits cloſe to a body muſt not be folded at all; but only ſweetly ſhaded to repreſent the part of the body that lies under it.

7. Obſerve the motion of the wind and air for drawing looſe apparel all one way, drawing that part of the garment firſt, which lies higheſt and cloſeſt upon the body, before you draw the looſer part that flies off from the body, leſt by drawing the looſe part of the garment firſt, you ſhould be out, and ſo place the body crooked or awry.

8. You ought alſo to examine the nature and diſpoſition of light, eſpecially as it has relation to the ſun or any bright body; for that colours cannot be ſeen but in the light, and by the help thereof they appear with a grace.

9. Suppoſe blue be equally diſperſed through all the parts of a garment, ſo that there is no more in one part than another; yet notwithſtanding, when it is illuſtrated by any light, it cauſeth one kind of brightneſs in that part where it ſtrikes ſtrongly, and another kind of luſtre where it ſtrikes more weakly, and another in that part where it yet ſhines leſs.

10. Now to imitate this blue, you muſt take your artificial *blue* colour, and temper it one way to expreſs the natural blue of the garment; but another way to expreſs it in the light, *viz.* you muſt mix ſo much *white* with your *blue*, as you find light in that part of the garment, where the light ſtrikes; more (or leſs) white, where it ſtrikes with leſs; and ſtill in proportion, leſs and leſs, till you come to the parts where the light ſhines not.

11. Where the light ſhines not but by *reflection*, there you muſt only mix ſo much ſhadow with the *blue*, as ſhall be enough to expreſs that counterfeit light, loſing it ſelf as it were by degrees; always taking care to make the lights and ſhadows to anſwer.

12. The folds or plaits ought to run out every way like branches or arms from the body of a tree; and to be ſo made, that one plait may ſo riſe from another, as one branch or bough or one ſtream of water comes out from another, in ſuch ſort that there be no part of the garment, wherein there appear not ſome of theſe folds.

13. Now theſe motions ought to be moderate, gentle and free, without any interruption, more to be admired for their grace and facility, than for affected pains and induſtry; and becauſe all ſorts of cloths have their ſeveral motions, as well as bodies; it muſt needs be, that they differ between themſelves, according to the things wherein they diſagree.

14. For this cauſe, there muſt be more light in fine cloth, as *ſarcenet*, *linen*, *cambrick*, *cypreſs*, &c. in which the plaits are ſmall, rais'd up, trembling, and as it were ſweetly waving; ſomewhat puff'd up; by extending and ſpreading themſelves like a ſnail, where the motion receiveth more ſtrength by the wind, they fall cloſe upon the bare skin, as is to be ſeen in women's garments, upon which, by reaſon of their thinneſs, they fall cloſe upon the parts, on that ſide where the wind blows, but are blown up on the contrary ſide; the ſame happens in mantles, the looſe ends of girdles and garters. All which motions more fitly appertain unto the apparel of nymphs, goddeſſes, &c. by reaſon of their lightneſs and airineſs.

15. Groſs and dull ſhadows are found in ſtiff cloths, where the plaits are few and groſs, ſo that they are capable but of ſlow motion, and therefore they ſink downwards, and can ſcarcely fall cloſe to the bare skin, for that their own groſſneſs ſuſtains them; and theſe motions do moſtly appear in cloth of gold, thick leather, coarſe woollen cloth, *&c.* upon which the air can have little or no force.

16. Moreover, the plaits or folds muſt have their motions accordingly as they are manag'd by the wearer, as under the arm

and under the knee, by opening and ſtretching out the arm and leg; always making hard, ſtiff and groſs folds, without weakneſs or pliableneſs, in ſuch ſort, that by their appearance, the nature and quality of the garment may be known.

17. But *mean motions*, which are neither too groſs nor too ſlight, are ſuch as appear in the folds of ſtuff and other cloths of fine wool; and theſe may eaſily enough be mov'd by the air, or become pliable to a perſon's limbs; and ſo make not only ſweet and pleaſant folds, but may follow the bare fleſh very well, becoming moveable and nimble, and falling pliably about the loins or any other part.

But beſides theſe, there are alſo other kinds of mixt motions, call'd turnings or croſſings, which are proper unto damasks, cloths of gold, ſattins, taffaties, *&c.*

In which, folds croſſing and breaking one another, appear from the various natures, qualities, and conditions of the drapery; but theſe things are ſo to be perform'd, as not to ſavour of an over affected imitation, without grace or order, to the ſcandal of the artiſt and his deſigns.

DRAPERIES. To make blue Draperies in miniature, put ultramarine near the white on your pallet, and mix them in ſuch proportions, as to produce a very pale colour and of a good body. With this you may expreſs your brighteſt lights; and afterwards add more ultramarine for ſuch as are darker, and ſo continue to do to the deepeſt fold and darkeſt ſhades, which muſt be pure ultramarine; and all this muſt be done with broad ſtrokes of the pencil, with a due regard had to the ſcumbling of the different degrees of light and ſhade, loſing the lights into the ſhades, with a colour not ſo pale as the lights, or deep as the ſhades. Then ſtipple the whole with the ſame colours and the ſame degrees, but ſomewhat ſtrongly, that the points may be ſeen; the whole muſt flow imperceptibly together, that the folds may not appear cut, and no line of ſeparation be ſeen. When for the deepeſt ſhades the ultramarine happens not to be dark enough, how much ſoever it may be gumm'd, you mix indigo with it to give them the laſt degree of depth; and if the lights are not ſtrong enough, you may heighten them with white and a very little ultramarine.

A carmine Drapery is done after the ſame manner with the blue, except that in the darkeſt places you lay on vermilion before you uſe the carmine, which is apply'd without any white, and in the deepeſt ſhades it muſt be well gumm'd. To deepen it the more, add a little biſtre.

There is another Drapery all of vermilion, with a mixture of white for the lights, laying it on ſingle upon the darkeſt parts, and adding carmine for the deepeſt ſhades. You finiſh then with the ſame colours, as in other draperies; and if the carmine and vermilion together are not ſtrong enough, take carmine alone, but only for the deepeſt ſhades.

A Drapery of lake is done like that of carmine, mixing a good deal of white therewith for the lights, and but very little for the ſhades: you are to finiſh with ſtippling, but we uſe no vermilion.

Purple Draperies are made by the ſame rule, having firſt prepar'd a mixture of carmine and ultramarine, and continually uſing white for the lights. If you would have it a columbine or light purple, your carmine muſt be in greater quantity than the ultramarine; but if you would have it be more blue and deep, let there be more ultramarine.

For a fleſh colour drapery, begin with laying on a very pale mixture of white, vermilion and lake; and ſhade with the ſame colours, diminiſhing the quantity of the white.

This Drapery muſt be very pale and delicate, becauſe it muſt repreſent a ſlight ſtuff, and even the ſhades muſt not be dark.

For a yellow Drapery, lay on all over, firſt maſticote, and then over that gambooge, excepting only the lighteſt parts, where you muſt leave the maſticote pure. Then ſhade with oker, mingled with a little gambooge and maſticote, increaſing and decreaſing the quantity of this laſt, according to the ſtrength of the ſhades; and when you want them to be ſtill darker, add gall-ſtone. You may work with gall-ſtone alone for the deeper ſhades, adding thereto biſtre, if it be not dark enough; finiſh with the ſame colours you began with, ſtippling and blending the lights with the ſhades.

For another ſort of yellow, uſe *Naples* yellow or *French* pink, inſtead of maſticote or gambooge.

Green Drapery is produc'd by colouring all over, with verditer, with which, if it prove too blue for you, you may mix maſticote for the lights, and gambooge for the ſhades. Then add a proportion of ſad green to ſhade with; and as your ſhades grow very deep, you muſt add the darker greens, and even uſe them unmix'd, where you want to be extremely dark. Finiſh with the ſame colours, a little darker than at firſt.

For a black Drapery, you muſt lay on black and white, and finiſh with the ſame, encreaſing the black as you want it for the ſhades; for the deepeſt of which add ſome indigo, eſpecially if you would give your Drapery the look of velvet. You may in all caſes touch up your lights with a brighter colour.

For a Drapery of white woollen cloth, lay on a mixture of white, a very little oker, orpiment, or gall ſtone, to give it a yellowiſh caſt; then ſhade and finiſh with blue, a little black, white, and biſtre mix'd together, adding this laſt for the browneſt ſhades.

A light grey is laid on with black and white, and finiſh'd with the ſame, made a little darker.

For a minim, dark, brown, tawney, or dun Drapery, lay on biſtre with white, a little brown red, and ſhade with the ſame mixture, but let it be a little darker.

There are other ſorts of Draperies, call'd changeable, becauſe the lights are of one colour and the ſhades of another; theſe are us'd for the cloathing of angels, and for other young and gay figures, as alſo for ſcarves, and other light parts of dreſs, which fall into a number of folds and flow to the wind. Theſe are moſt commonly purple, and of theſe there are two ſorts, the one with blue lights, and the other with yellow.

For the former, lay on ultramarine and white very pale for the lights, and ſhade with carmine, ultramarine and white, the ſame as for a purple drapery, ſo that only the very brighteſt lights appear blue, and even then you muſt ſtipple with purple, with a large quantity of white, and ſcumble the whole artfully together.

For the latter, uſe maſticote for your lights inſtead of blue; then proceed as for a drapery of pure purple, except that you muſt ſtipple and blend lights with the ſhades, that is the yellow with the purple, by the help of a little gambooge.

Carmine red is order'd like this laſt, that is, the lights muſt be maſticote, and the ſhades carmine; and to ſcumble them, you muſt uſe gambooge.

Lake red, like carmine.

Green muſt be order'd in the ſame manner as lake, continually mixing verditer with the ſadder greens for the middling ſhades.

Many other ſorts of theſe may be contriv'd at pleaſure, keeping to the union of the colours, not only in one figure, but alſo in a group of ſeveral figures, avoiding, as much as the ſubject will permit, to put blue next to a flame colour, or contraſting green with black, and ſo of others that diſagree or afford no proper union.

Other Draperies may be made of ſad, dirty, and brown mixtures and ſimples, and all by the directions already given; others alſo may be contriv'd, both of broken and complicated colours, but a harmony between them muſt be preſerv'd, that they do not offend the eye. There is no laying down a rule to guide you in this; you muſt by practice and experience make your ſelf acquainted with the power and effect of your colours, and work accordingly.

Linens are painted thus: Having drawn your folds, as when you do Drapery, lay on white all over, and then proceed and finiſh with a mixture of ultramarine, black and white, taking more or leſs of this laſt, according to the degrees you want of light and ſhade; and for the deepeſt folds, take biſtre and a little white, uſing it ſparingly and with artful touches; and you may even take the former alone for the deepeſt ſhades, where you muſt expreſs the folds, and loſe them into the reſt.

They may be made after a different manner, by laying on, all over, a very pale mixture of ultramarine, black, and white, and then proceed in the manner above directed with the ſame mixture, but a little deeper. And when the ſhades are ſtippled and finiſh'd, you muſt heighten the lights with pure white, blending them with the firſt colour or ground; but of what ſort ſoever you make them, you muſt when they are finiſh'd, prepare ſome yellowiſh tints for certain places, laying them on lightly, as it were a waſh, ſo as to be tranſparent, and neither to hide the ſtippling nor the ſhades.

Yellow linens are made of white mix'd with a little oker; then proceed and finiſh with biſtre, mixt with white and oker; and for the deepeſt ſhades, with biſtre alone. Before you finiſh, lay on tints of oker and white here and there, and others of white and ultramarine, as well upon the ſhades as the lights, but very thin; and then ſtipple and ſcumble the whole together, and it will have a fine effect. As you finiſh, touch up the extremities of the lights with maſticote and white. Theſe linens, and the former, you may ſtripe like *Egyptian* ſcarves, with blue, red, ultramarine and carmine; a red one between two blue ones, very bright on the lights, and ſtronger in the ſhades.

The heads of virgins are generally dreſs'd with veils of theſe ſorts, and of the ſame are made a ſort of handkerchiefs for an open breaſt, becauſe they are very becoming to the fleſh.

When you would have either the one or the other of them to be tranſparent, and ſhew whatever, whether ſtuff or fleſh, is underneath, lay them on at firſt very thin, and mingle with your ſhading colour, a little of that which is under them, particularly at the extremities of the ſhades, and touch only the extremities of the lights (only for the yellows) with maſticote and white, and for the whites with white alone.

They are alſo to be made another way, eſpecially when you would have them quite tranſparent, as muſlin, lawn, or gauſe. To this purpoſe, you muſt begin and finiſh what is beneath, as if nothing was to be over it; then heighten the brighteſt folds with white and maſticote, and ſhade with biſtre and white, or black, or blue and white, according to the colour you aim at, and taking away from the livelineſs of the reſt by ſoiling it over, though that be not altogether neceſſary but for the darker parts.

For crape, do as above, only obſerve, that you draw the folds and the borders or edges with little threads alone, upon what is beneath, which muſt firſt be finiſh'd.

When you would water a ſtuff of any ſort, you muſt wave it with lighter or darker colours, according as what you are upon is light or ſhade.

There is ſuch a way of touching your Draperies, ſo as to diſtinguiſh the ſilken from the woollen; theſe are more coarſe and ſtiff, the others are finer, and more free or gloſſy; but it muſt be remember'd, that theſe are effects which depend partly upon the ſtuff itſelf, and partly upon the colour of it; and in order to apply them in ſuch a manner as ſhall be agreeable to the ſubject and to diſtance, I ſhall here diſcourſe on their different qualities.

We have no colour that partakes more with light than white, or that comes nearer to the air, which ſhews it to be weak and fading; nevertheleſs you may uſe it for the neareſt parts of your picture, or bring it out towards you, by the aſſiſtance of ſome heavier and ſtronger colour, or by mingling them together.

Blue is the moſt fading, or rather the weakeſt colour of all, whence the sky and diſtant proſpects are of that colour; but it will fade the more, the more 'tis mix'd with white.

Pure black is the heavieſt and moſt terrene of all, and the more you mix it with other colours, the more they will be of the ſame nature.

Now the different natures of black and white produce different effects in them; for often the white throws back the black, and the black brings forward the white. Under white we here comprehend all the light colours, and under black we ſuppoſe all that are heavy.

Ultramarine is then a colour weak and light.

Oker is not quite ſo much.

Maſticote is very light, as alſo verditer.

Vermilion and carmine are next to them.

Orpiment and gambooge are ſomething leſs ſo.

Lake holds a mean more kind than rude.

Of COLOURS *for* DRAPERY.

1. For *ſcarlet* garments. Take *vermilion* deepened with *cinnabar* and heightened with touches of *maſticote.*

2. For *crimſon.* Lay on *lake* very thin, and deepen with the ſame.

3. For *purple.* Grind lake and ſmalt together, or take *blue-bice* and mix it with *red* and *white-lead.*

4. For an *oriental violet.* Grind *litmoſe*, *blue-ſmalt* and *ceruſs*, but let the *blue* predominate in the mixture.

5. For *yellow.* Take *maſticote* deepened with *brown oker* and *red-lead.*

6. For a *carnation.* Grind *ceruſs* well waſh'd with *red-lead* or *ceruſs* and *vermilion.*

7. For a *ſtraw* colour. Take *maſticote,* then white heightened with *maſticote* and deepened with *pink,* or thus; take *red-lead* deepened with *lake.*

8. For *yellowiſh.* Take thin *pink* deepened with *pink* and *green.*

9. For a *light purple.* Mingle *ceruſs* with *log-wood* water, or take turnſole mingled with a little *lake, ſmalt* and *pica.*

10. For *blue.* Take *azure* deepened with *Indy-blue* or *lake* heightened with *white.*

11. For a *light blue.* Take *blue-bice,* heightened with *ceruſs* or *ſpodium.*

12. For a *sky-colour.* Take *blue-bice* and *Venice ceruſs,* but if you would have it dark, take ſome *blue* and *white.*

13. For a *pure green.* Take *verdegreaſe,* bruiſe it and ſteep it in muſcadine for twelve hours; then ſtrain it into a ſhell, to which add a little *ſap-green* (but put no gum thereto.)

14. For a *popinjay-green.* Take a perfect green mingled with *maſticote.*

15. For a *peach colour.* Take *braſil* water, *log-wood* and *ceruſs.*

16. For a *black velvet.* Lay the garment firſt over with *ivory-black,* then heighten it with *cherry-ſtone-black* and a little *white.*

17. For *black ſattin.* Take *cherry-ſtone-black,* then white deepened with *cherry-ſtone-black*; and then laſtly *ivory-black.*

18. For *white ſattin.* Take firſt fine *ceruſs,* which deepen with *cherry-ſtone-black,* then heighten again with *ceruſs,* and fine touches where the light falls.

19. For a *ruſſet ſattin.* Take *Indy-blue* and *lake,* firſt thin, and then deepened with *Indy* again.

20. For to ſhadow *ruſſet.* Take *cherry-ſtone-black* and *white,* lay a light *ruſſet,* then ſhadow it with white.

21. For a *changeable ſilk.* Take water of maſticote and *red-lead,* which deepen with *ſap-green.*

22. For a *hair.* It is made out of *maſticote, umber, yellow oker, ceruſs, oker de luce* and *ſea-coal.*

23. For a *fire colour.* Take maſticote and deepen it with *maſticote* for the flame.

24. For *cloth of gold.* Take *brown oker* and liquid *gold water,* and heighten upon the ſame with ſmall ſtrokes of *gold.*

25. For a *walnut colour.* Take red-lead, thinly laid, and ſhadow with *Spaniſh brown.*

26. For a *tree.* Take umber and white, wrought with *umber* deepened with *black.*

27. For the *leaves.* Take *ſap-green* and *green-bice*, heighten with *verditer* and *white.*

28. For *banks.* Take thin *umber* deepened with *umber* and *black.*

29. For *water.* Take blue and white deepened with *blue*, and heightened with *white.*

30. For *feathers.* Take *lake* frizzled with *red-lead.*

To take the perfect DRAUGHT *of any* PICTURE. Take a ſheet of fine *Venice* paper, wet it all over with linſeed oil on one ſide, then wipe it off as clean as you can; let the paper lie by till it is throughly dry; then you may lay it on any painted or printed picture; then with a black lead pencil you may draw it over with eaſe, put this oil'd paper upon a ſheet of clean white paper, and with a little pointed ſtick or feather out of a ſwallow's wing, draw over the ſtrokes, which you drew upon the oil'd paper; and ſo you will have the exact form upon the white paper, which may be ſet out with colours at pleaſure.

2. *Or thus*; having drawn the picture as before in the oil'd paper, put it upon a ſheet of white paper, and prick over the drawing with a pin; then take ſome ſmall coal reduc'd to a fine powder, and wrap it in a piece of fine linen, and tie it up looſely and dab it lightly all over the prick'd line by little and little, and afterwards draw it over again once or twice, with the pen or pencil.

3. *Or thus*; rub a ſheet of white paper all over with black-lead on one ſide, or elſe with *vermilion* mixt with freſh butter, lay the colour'd ſide on a ſheet of white paper; then lay the picture you would copy out upon the other ſide of the colour'd paper, and with a ſwallow's quill or ſmall pointed ſtick, go over all the ſtroaks of the picture, and it will be exact on the white paper.

4. *Or thus*; lay a piece of lanthorn horn upon the picture, then draw the ſtroaks of your picture with a hard nip'd pen upon the horn; and when it is dry breathe upon the horn twice or thrice, and preſs it hard upon white paper a little moiſtened.

5. *Or thus*; take an oil'd ſheet as at the firſt ſection, rub one ſide of it with lamp-black or lake, lay it upon a fair paper with the colour'd ſide downward, and upon it lay the picture you would copy out, and trace it over with a ſwallow's feather.

6. *Or thus*; take fine lake mixt with linſeed oil and draw with it, inſtead of ink, all the out-ſtrokes of any picture, and other material parts; then wet the contrary ſide of the picture, and preſs it hard upon a ſheet of paper, and it will leave behind it all that which you drew over.

7. *Or thus*; grind printer's black fine and temper it with water, and with a pen dipt in it, draw over the out-lines and maſter ſtrokes; then wet ſome white paper with a ſpunge or the like, and preſs it hard upon it, and you will have the ſtrokes you drew upon white paper.

8. *Or thus*; lay the print (the backſide of it) upon a clear glaſs or oil'd paper; then lay a clean paper upon the print, hold it up againſt the light, ſo will you ſee all the ſtrokes, which you may draw out and ſhadow alſo if you pleaſe.

Of the imitation of DRAUGHTS.

I. A learner ought to acquire a habit of imitation by many and often trials; which if it be to be done with the pen, take care to avoid ſcratching and making thin and lean ſtrokes, but rather broad ones drawn from above downwards; but ſome of the hatches muſt be ſharp, ſome broad, ſome unequal, ſome equal according to the ſhades.

II. Hold the pen or pencil ſomewhat long (and not ſo upright, as is uſual in writing) ſeeming as though you laid it ſtrait forward, and if you draw with paſtils uſe yourſelf to turn them in your hand; and this will hinder their growing blunt ſo ſoon.

III. In ſhadowing a draught you muſt begin firſt to do it faintly and ſmoothly, and ſtrait againſt the edges of the light, ſo that it may look as if it had been daſh'd with a bruſh pencil; and then overſhadow it again here and there farther out in the darkeſt ſhades, and adorn it with hatchings, and where any thing more is requir'd, put it in nimbly and clearly by gentle touches, which will add a great grace to the work.

IV. *Doeſling* (which is a certain beſmearing of the work) is to be done with crayons of red or black chalk, touching the draught eaſily, all over ſmoothly and evenly with the points of them, and not with cotton or the like put up into quills, as the practice of ſome is, though that may be done in ſome caſes, when one work is to be brought into another.

V. If copies be taken (chiefly upon colour'd paper) to make it curious and neat, let the edge of the heightening be ſmooth'd a little (not with cotton, but) with the like coloured paper, rolled up to a ſharp point at one end, and by this means you may take away the ſharpneſs and hardneſs of the edges, and make them look ſweet and pleaſant.

VI. In performing theſe things, a certain kind of waſhing is ſometimes neceſſary, being done with pencils dipp'd in ſome coloured liquor, and ſo laid upon coloured paper; and this is to be done ſometimes through the whole work, and ſometimes but in part, *viz.* in ſome principal flat ſhades, which may be afterwards wrought over with a pen or black chalk, and will look very pleaſantly.

VII. This waſhing muſt at firſt be done very weak and faint; yet ſmooth, (without ſmoothing it at the edges except by a new ſtroke of the pencil moiſtened with your tongue; for ſuch ſmoothing will ſpoil the work) this firſt waſhing being dry, go over your work again, yet only thoſe parts where there ought to be a darker ſhade; and afterwards again, give ſome deeper and harder touches, without ſmoothing, which will very much ſet your work off.

VIII. Faint ſhadows and things that are obſcure, muſt be repreſented as faintly as may be, chiefly upon coloured paper, where the heightening helps you; but take care not to go too often over the ſhades; leſt you ſpoil them by making them too hard and ill favoured.

IX. In drawing either a draught or the life, firſt obſerve the thing in general, in reſpect to the circumferent ſtrokes; for they are thoſe which bound and contain all the parts of the whole, and without which the particular parts can never be perfectly diſtinguiſhed, nor repreſent themſelves in their being. This done, then conſider in like manner the parts; and ſuppoſing the parts each to be a whole, you may come to repreſent the parts of parts, and by the ſame means expreſs the whole of any draught whatſoever.

To take off a DRAUGHT *in a ſtanding* RED *colour for* TRACING. Mix *vermilion* very finely ground with a little freſh butter, and rub it on one ſide of a clean ſheet of paper, till it will bear a ſlight touch of the finger, without leaving the paper too freely; then uſe this colour'd paper by laying on your print, and trace every line you pleaſe, as is directed in tracing, but the three papers muſt be pinn'd together at the corners to prevent their ſlipping; for if any of them ſhould ſlip, the work would be ſpoil'd; for if by any means the papers be mov'd out of their place, it is hardly poſſible to place them right again.

This impreſſion made by tracing will hold without rubbing.

The quills taken from a ſwallow's wing are very good for tracing, after they have been lay'd by till they are thoroughly dry.

You may if you pleaſe uſe *carmine* with butter after the ſame manner; and then your drawing will be of a more beautiful colour, or you may colour a paper with blue bice and butter after the ſame manner, if you would have your drawing blue.

The taking DRAUGHTS *with* RED *looſe* INK. Mix ſome *vermilion* finely ground with fair water in a gallipot with ſome *cotton*, and it will run very freely in the pen, ſo that one may make as fine ſtrokes as he pleaſes; then with this mixture draw over all the ſtrokes of your print, imitating both the finer and ſtronger lines; then dip a ſpunge in gum-water, with a clean white paper, and while it is wet turn the print upon it, and preſſing it well take off the print, and all the ſtrokes will remain upon the clean paper, and as ſoon as it is dry the *vermilion* will be fixt to it.

This method is us'd by writing maſters, when they have a book of writing to be engrav'd, they write with this looſe ink, and the engraver turns the written ſide downwards on the copper plate, firſt finely covered with white wax, which being very well rubb'd on with an iron-tool us'd by engravers, the impreſſion will remain upon the wax.

Taking DRAUGHTS *with* BLUE *looſe* INK. You may make a looſe ink with blue bice and common water; which will run very freely from a pen and will ſerve for the ſame uſe, and is to be us'd after the ſame manner as the beforementioned red ink.

To COPY DRAWINGS, *&c. to take a drawing with fixt* INK. Take a thin ſheet of paper and rub it all over with freſh butter as equally as poſſible; then dry it well by the fire, and rub the butter'd ſide with carmine, till it is all equally colour'd, or elſe you may rub it over with lamp-black or black-lead powder, or with blue bice finely ground.

But care muſt be taken in the rubbing on any of theſe colours, that it be done ſo, that the colour will not come off by a very ſlight touch of the finger, and they are then fit for the work.

When you would copy a print or deſign, lay the coloured ſide of the butter'd paper upon a piece of clean paper, and your print upon the butter'd paper; then with a fine pin or needle, blunted a very little at the point, carefully trace the out-lines of your print copy, and you will have a good copy of it upon the white paper; which may be touch'd up afterwards by crayons of the like colour.

The proper materials for drawing.

And theſe are either black-lead pencils or black-lead fix'd in a port crayon, charcoal, red, black, or white, chalk, paſtils or crayons, pens or hair pencils and *Indian* ink.

Black lead is as proper in the beginning to practiſe after the plain lines, *&c.* as any other material, the ſtroke it makes being ſmooth will pleaſe the young learner better than what is effected by charcoal or crayons.

Slope your lead with a penknife to a fine point, that it may caſt a ſmall neat ſtroke, if it is not made into a pencil, then fix your piece of lead into a port-crayon, and whatever you sketch with, accuſtom yourſelf from the beginning to hold them long in your hand, that the end of your fingers may be at a much larger diſtance from the point, than they are from the nip of a pen in writing; and form your ſtrokes with light gentle touches, by theſe means they will have a greater command of hand, and your out-line will be more free and bold.

When you begin to practiſe after limbs and figures, it will be uſeful to draw the rough ſketch with charcoal, the ſtrokes made therewith being eaſily diſcharged from the paper.

Your charcoal muſt be ſlit into ſmall ſlender pieces to fix in a port-crayon, for a better conveniency of holding it; you muſt then ſharpen it to a proper point, and with a light hand ſketch after your original as correctly as you can; what you diſapprove of in this performance may eaſily be wiped out, by gently bruſhing that part with a feather or clean rag.

Your out-lines being ſecured with your charcoal, wipe them in a ſlight manner with a feather that it may appear faint, then go over your lines with your black or red lead, making them yet more correct if you can; when this is done, if upon reviewing it there appears any errors you would amend, you may diſcharge the paper of what part of the drawing you pleaſe, by rubbing that part with the crumb of a ſtale white loaf, red lead, and red or black chalk, which are us'd in like manner as black lead.

White chalk and tobacco-pipe-clay are us'd in heightening or giving ſtrong lights, and in drawing on coloured paper.

Paſtils or crayons are any colours mixt with tobacco-pipe-clay, which while ſoft and in the conſiſtency of a paſte, is rolled up in pieces about the thickneſs of a quill, and two or three inches in length, and then dried; they are generally us'd on colour'd paper, but never in a way of hatching as black or red lead many times are; but the colours are rubbed and wrought one into another in ſuch a manner, that no ſtrokes appear, but the whole looks as if it was done with a bruſh.

This is a very quick and expeditious manner of drawing, and when the crayons are handled with judgment, they never fail of a delicate ſoftneſs and fine expreſſion; but this muſt be obſerv'd, that the touch of a rude finger unacquainted with the performance, may eaſily ſpoil the fine work while only handling it to look on it; therefore it ſhould not be forgot to preſerve it in books or under glaſſes in frames. The grain of the paper on which they are us'd ſhould be a little rough, the crayons working eaſier and expreſſing themſelves ſtronger than when the paper is ſmooth; if it is a little dark or browniſh near the colour of whited brown paper, it yields a good relief to the tender parts of the work, by ſhewing the light ſtrokes of the work. Pens are ſometimes us'd in ſhading draughts, in hatching them with croſs ſtrokes, but this is better perform'd with hair pencils and *Indian* ink, which are not only us'd in hatching by ſtrokes, but in ſhading after a far more expeditious manner, *viz.* by waſhing, which is the ſame as in water working with hair pencils and *Indian* ink, as with hair pencils and water colours. The ſhades in hatching are effected by lines, and appear in the ſtrokes, which in an engraven print, contrary to this in waſhing, there does not appear any lines, but the ſhades look like thoſe in metzotinto print.

Directions, &c. *for a young practitioner in the art of* DRAWING. Draw all your out-lines generally at firſt very faint with a coal, becauſe if amiſs you may rub them out with the feathers of a duck's wing, and by being feint, it may be the eaſier mended; but if you lean hard and draw very black, it will not eaſily rub out.

In the next place, be ſure to draw all your out-lines right and agreeable, according to the pattern you draw after, before you begin to ſhadow any part of it.

Then obſerve to draw thoſe out-lines next to the light very tender and faint.

Likewiſe obſerve in all your drawings the rules and proportions preſcrib'd in general elſewhere.

After you have drawn one feature, that may ſerve in ſome meaſure for direction how to draw the other, by obſerving exactly with your eye, being guided by reaſon, the diſtance from that to the next feature, making a ſmall mark with your coal where it is to be plac'd, and then draw it and ſo on to the next.

This obſerving of the diſtances is neceſſary in a whole figure, and in every thing elſe.

In a figure you obſerve by the diſtance from one muſcle or joint, or limb to the other, and the ſame in all things elſe.

Obſerve their bigneſs, their length, their windings and turnings, and alſo their ſhadow.

Take care to ſhadow it next to the light extremely faint, and where you ſee bold and free touches, be not timorous in expreſſing the ſame.

Be ſure in drawing of a head by the life or otherwiſe, that you obſerve to place the features exactly right upon the croſs lines, whether it be a full face or a three quarter one.

As for ſuch heads as fly upwards in *fore-ſhortening*, there you muſt obſerve to make the croſs-lines to fly upwards; and in thoſe heads that decline with the aſpect downwards, to make them bending in a circular manner and not ſtreight. See the plate in letter H.

After you have the out-lines true, proceed to trace over the ſame lines with a pen, which you sketch'd out before rudely with a coal, and draw all the out-lines more exactly, and then finiſh by degrees, by imitating all the hatches that are in the print with your pen.

Obſerve the diſtances of one hatch from another with all the croſſings, turnings and windings, and be not timorous in following any of them; but bold and free.

Of DRAWING. *The precepts in general are,*

I. Begin with *plain geometrical figures*, as lines, angles, triangles, quadrangles, polygons, arches, circles, ovals, cones, cylinders, and the like; for theſe are the foundations of all other proportions.

II. The circle is uſeful in all orbicular forms, as of the ſun, moon, globes, *&c.* the oval in giving a juſt proportion to the face, and mouth, &c. the ſquare confines a picture you are to copy, &c. the triangle is of uſe in drawing a ſide or half face; angles and arches in perſpective, and the polygon in ground-plats, fortifications, &c. the cone in ſpires, ſteeples, tops of towers, &c. the cylinder in columns, pillars, pilaſters, *&c.*

III. Having brought your hand to be fit and ready in general proportions, enure your ſelf to give every object its due ſhade according to its concavity or convexity, and to elevate or depreſs the ſame, as the object appears either nearer or farther off the light, which is indeed the life of the work.

IV. The ſecond practice of drawing conſiſts in forming fruits, as *apples*, *pears*, *cherries*, *peaches*, &c. with their leaves; the imitation of flowers, as *roſes*, *tulips*, *carnations*, &c. herbs, trees, *&c.* of different kinds.

V. The third in the imitation of beaſts, fowls, fiſhes, *&c.*

VI. The fourth practice of drawing conſiſts in the imitation of the body of man, with all its lineaments, as head, noſe, eyes, ears, cheeks, hands, arms, and ſhadows, all exactly proportioned, both to the whole and to one another, both as to ſituation and magnitude.

VII. The fifth is in the drapery, in the imitation of clothing and artificially ſetting off the outward coverings, habit, and ornaments of the body, either of cloth, ſtuff, ſilk, or linen, their natural and proper folds.

VIII. In drawing of all the forms before mentioned, it is requiſite to be firſt perfect in the laying down the exact proportions; ſecondly, in the general or outward lines, before you proceed to ſhadowing or trimming the work within.

IX. In mix'd and uncertain forms, where the circle, ſquare, *&c.* will be of no uſe (but only the idea thereof in your own fancy) as horſes, oxen and the like; you muſt do it by judgment, and ſo gain the true proportions by aſſiduous practice, thus:

Having the ſhape of the thing in your mind, firſt draw it rudely with a coal, then with more exactneſs with a lead or pencil; then peruſe it well, and mend it in thoſe parts you find you have err'd, according to the idea you carry in your mind. Then view it over again, correcting the other parts by degrees, to the greateſt exactneſs you poſſibly can, tho' you do it twenty or more times over.

When you have mended it as well as you can by your own judgment, compare it with ſome good pattern or print of the like kind; and amend it by that, giving every thing its due proportion.

X. Having good copies or patterns to draw after, learn to reduce them to other proportions, either larger or ſmaller, and this by often and many trials.

XI. When the young artiſt can do the before-mentioned very well, let him begin to practice in drawing, wherein the liberty of imitation is preſented in the largeſt latitude; and this muſt be attained by much practiſe, and diligent exerciſe, and the inſtructions of a good maſter.

XII. Let a perfection in drawing be attain'd, before there be any attempts as to colouring and painting; for after the firſt is attain'd, all belonging to the latter will be eaſily underſtood and gain'd by practice.

Particular obſervations as to DRAWING.

I. If you draw after a print or picture, place it in ſuch a light, that the gloſs of the colours may not interrupt your light, but ſo that the light and your eye may equally and obliquely fall upon the piece; which ſhould be plac'd at ſuch a diſtance, that upon opening of your eyes, you may view it all at once; the larger the picture is, the greater diſtance off it ſhould be plac'd, and which muſt be right before you and a little reclining.

II. Draw all your out-lines at firſt very faint with a coal, which may eaſily be rubb'd out with the feathers of a duck's wing, or a crum of bread, which ſo may be the more eaſily mended; but will be more difficultly rubb'd out, if you lean hard on your coal, and draw very black.

The out-lines ought to be drawn true and agreeable to the pattern, before you begin to ſhadow any part of it.

Thoſe out-lines which are next the light, ſhould be drawn very ſoft and faint; when you have drawn one feature, that ſhould in ſome meaſure be a direction to you to draw the other, by obſerving with your eye the diſtance from that to the next feature, making a ſmall mark at the place with your coal, and then draw it, and ſo to the next, till you have drawn the whole figure.

III. Then obſerve the middle of the picture you would copy, and touch upon the paper with the point of your coal; then obſerve the more perſpicuous and uppermoſt figures, (if there are more than one) which you are to touch lightly in their proper places. Thus running over the whole draught, you will ſee, as it were, the skeleton of the piece you would draw.

But, if you proceed without theſe conſiderations of what your draught will run to, when you have ended your work, you will be forc'd to draw the ſame many times over and over again, and perhaps every time to as little purpoſe; by the tedioufneſs of which, your ingenuity will be dulled or diſcouraged.

IV. Take care to draw a juſt and true draught, although you advance in it but ſlowly; it may be better to beſtow two or three days, at times, upon a piece you may think you can do in two or three hours.

V. Having made theſe out-sketches, view them diligently, if they anſwer your pattern or not; for the geſtures of the life ought to ſhew themſelves eminently in the firſt and rudeſt draughts thereof; without which, it is certain your work will be faulty.

VI. When you have view'd theſe sketches, begin to correct and mend them (wherever you perceive any thing amiſs) adding and diminiſhing by degrees a little here and there wherever you ſee it vary from your pattern; and by this method it will be brought nearer and nearer to the life.

VII. Obſerve the diſtance of one limb, joint, or muſcle from another, and the ſame in all other accidents of the figure, their length, breadth, largeneſs, thickneſs, turnings, ſhadows, &c.

Shadow next to the light very faintly, and where you ſee bold and free touches, be not timorous in expreſſing the ſame.

In drawing a *head* by the life or otherwiſe, take care to place the features exactly right upon the croſs lines, whether it be a full face, or a three quarter face, as you ſee in the examples.

In *foreſhortening*, you muſt make the croſs lines to fly upwards, where they look upwards; but where the aſpect is downwards, they muſt be made downwards in a circular manner.

Having drawn the out-lines true with a coal, then you are to proceed to trace the ſame lines over again with a pen, drawing them with more exactneſs; and by imitating all the hatches with their exact diſtances one from another, their croſſings, turnings and windings, with much boldneſs and freedom perfect your deſign.

This may eaſily be done with charcoal, becauſe what is amiſs may be wip'd out.

VIII. If you draw after plaiſter and emboſs'd works, chuſe a good north light, which light ſhould deſcend from above, not dilating and ſcattering it ſelf too much, by which the work may be more pleaſantly ſhaded.

If the room has a ſouth light, place ſome oiled paper before the window; and if you draw by candle light, make uſe of a lamp, ſhaded with oiled paper; for a candle will by burning grow lower and lower, which will cauſe the ſhades to change; all which may be avoided by a lamp.

IX. Place your ſelf about three times as far from the pattern, as the pattern is high, ſo that your eye may view it in a direct line; then take an obſervation with a plumb-line, what part of the pattern appears to you, by extending it ſtrait, and how they come in ſight one under another, and accordingly take your fundamental sketches, as has been before directed.

X. In order to draw the muſcles of a human body, you muſt have either the life or very good patterns, of which there are a ſufficient number to be found in anatomical books, but eſpecially in *Jacob Vander Gracht*'s book, compleated with many varieties and curioſities; from whence the alteration and changes, riſings and fallings, extenſions, contractions, and other operations of the muſcles, arteries, and particular members, are in imitation of the life excellently depicted.

XI. In drawing after a naked body, all the muſcles are not to be ſo plainly expreſſed as in anatomical figures; but that ſide whoſe parts are moſt apparent and of ſignification in the performance of any action, muſt be made to appear more or leſs, according to the force of that action.

XII. In drawing of young perſons, the muſcles muſt not appear manifeſtly ſo hard, as in elder and full grown perſons.

The ſame is to be obſerv'd as to fat and fleſhy perſons, and ſuch as are very delicate and beautiful.

And in women, ſcarce any muſcles at all are to be expreſſed, becauſe that in the life, they do either not appear at all, or but very little, unleſs it be particularly in ſome forcible action; and then too they are to be repreſented but very faintly, leſt the ſingular beauty of the body be thereby ſpoil'd. The like is alſo to be obſerv'd as to little children.

XIII. The motion of the whole body muſt be conſidered in drawing of the muſcles; as in the riſing or falling of the arms, the muſcles of the *breaſt* do appear more or leſs. The *hips* do the like, according as they bend outward or inward; and it is the ſame chiefly in the ſhoulders, ſides, and neck, according to the ſeveral actions of the body; all which alterations are firſt to be obſerv'd in the life.

XIV. The breadth and largeneſs of a picture is alſo to be conſidered; it ſhould be larger about the legs and garments, ſhewing it ſlender above, as it were pyramidically, by diſcovering one ſhoulder and hiding the other, which is ſhortened by turning the body.

XV. But ſometimes the figure is to be repreſented biggeſt in the upper parts; by repreſenting either both the ſhoulders, or both the arms, ſhewing the one leg, and hiding the other, or both of them after one manner, as the diſcretion of the artiſt ſhall ſee meet.

XVI. Neither ought this to be obſerv'd only in the whole body, but even in every part; ſo that in the legs, when a muſcle is rais'd outwards on the one ſide, that which is directly on the contrary ſide muſt be drawn in and hid, for ſo it appears in the life.

XVII. The proportion of the figure ought to be multiplied by degrees, in proportion of one to two, three, four, *&c.* for herein the chief skill conſiſts; the diameter of the biggeſt place between the knee and the foot, is double to the leaſt, and the largeſt part of the thigh triple.

Of DRAWING *the Face of a Man.*

I. In drawing of a face, the firſt thing to be done is to obſerve its motion, whether upwards, downwards, forwards, or ſideways; whether it be long or round, fat or lean, big or ſmall.

For if the face be fat, the cheeks will ſeem to ſwell; *if lean, the jaw-bones will ſtick out, and the cheeks fall in*; *but if it be neither too fat nor too lean, it will be for the moſt part round.*

II. Touch the features, where the eyes, noſe, mouth and chin ſhould ſtand lightly (after you have firſt drawn the circle or oval of the face) then make a ſtroke down from that place which is even with the chin, drawing it down where the middle or tip of the noſe and middle of the mouth ſhould be placed, which ſtroke muſt be made ſtrait down in a full right face; but arch'd or oval in an oblique face, leaning that way towards which the face turns; then croſs that ſtroke about the middle of the eyes, either with a ſtrait line in a right face or with a curved line, either upwards or downwards, according to the preſent action or poſture of the face; then make another anſwerable to that, where the end of the noſe ſhould come, and another for the mouth, that it be not made crooked.

III. This croſs is difficult to be underſtood in *plano*; but upon a face made upon a ſolid body in form or ſhape of an egg, the ſeveral variations of the ſaid croſs are moſt excellently demonſtrated; and a learner may from hence underſtand all the variations of a face, and thereby draw it all manner of ways, as upwards, downwards, forwards, backwards, ſideways, *&c.* and that only by the motion of the ſaid oval ſolid, accordingly as you may eaſily perceive in the former figures.

IV. Then if the face look upwards towards heaven, or downwards towards the earth, let the eyes, noſe, mouth, and brows look accordingly with it; and next proceed to the placing of the features.

V. In a face of a juſt proportion, the diſtances; 1ſt, between the top of the forehead and the eye-brows; 2d, between the eye-brows and bottom of the noſe; 3d, between the bottom of the noſe and the bottom of the chin are equal.

VI. In drawing the utmoſt circumference of a face, take in the head and all with it, leſt you ſhould be deceiv'd in drawing the true bigneſs.

VII. Then you are to conſider all thoſe chief touches, which give life to a face, adding a grace to it, and ſomething that ſhall alſo diſcover the diſpoſition of the mind.

So the *mouth* extended, and the corners turning a little up, ſhews a ſmiling countenance.

The eye-brows bending, and the forehead and top of the noſe, between the eye-brows wrinkled, repreſents a frowning countenance.

The upper *eye lid* coming ſomething over the ball of the eye, ſhews a ſober and a ſtaid countenance.

There are alſo many other touches which give life and ſpirit to a face, which you may find out by degrees, by good obſervation of good prints.

VIII. The diſtance between the eyes ſhould in a full face be the length of one eye; but it is to be leſſened proportionably in a three quarter or half face; and the noſtrils muſt be plac'd exactly under the corners of the eyes.

IX. When you have given touches where the eyes, noſe, mouth and chin are to be plac'd, then begin to draw them more exactly, and ſo proceed till you have finiſh'd the face; after which, draw the hair, beard, ſhadows, and other things about it.

X. You muſt take great care to place the ſhadows right, and be ſure not to make them too dark, where they ſhould be faint; becauſe they can never be rendered lighter afterwards, and ſo the whole face will be ſpoil'd.

You muſt remember that the ſhadows muſt be more faint and light in a fair face than in a ſwarthy one.

XI. When you have finiſh'd the face, give here and there ſome hard touches with your pen, where the ſhadows are to be darkeſt; then proceed to the ears and hair, firſt drawing the out-line, and afterwards the principal curls or maſter-ſtrokes in the hair; and theſe will be a guide to you as to the leſſer curls, which depend upon the firſt; taking care to make the curls to bend exactly, according to the pattern that they may lie looſely or careleſly, and not ſtiff and forced; having drawn the curls, ſtrike in the looſe hairs, which hang ſcatteringly out of the circles.

XII. In forming the ear, deſcribe an oval as it were, and proceeding lightly, join ſtroke to ſtroke in ſuch manner as you ſee in the figures, ſo that the ear may be intirely form'd, without any digreſſion from the bounds of nature or art.

XIII. In the laſt place, having practis'd by rule till you have brought your hand in, in drawing of any thing, firſt ſtroke the out-lines, the principal veins and muſcles lightly, and ſhadow them afterwards, always making uſe of the beſt copies or prints, which will both encreaſe your judgment, and bring you to a good command of hand.

Of DRAWING *the extreme parts.*

I. In drawing the *hands*, don't draw all the joints, veins, or other things to appear plainly, but only lightly and faintly; and ſtrike out the ſize of the hand and the manner of its turning with faint touches, and not with hard ſtrokes.

II. After you have done this, part the fingers according to your pattern, with faint ſtrokes alſo; then mark the place where any of the fingers ſtand out from the others with a faint reſemblance.

III. Having done this, proceed to draw theſe parts more perfectly, making the bending of the joints, the wriſts, and other principal parts more exactly; then go over them again, drawing every ſmall bending or ſwelling of the fingers, nails, knuckles, and veins, ſo many of them as do appear.

IV. Acquaint your ſelf from good prints, with the juſt proportions of the hands, with their equal diſtances, always obſerving this rule, that according as it turns, either one way or the other, to ſhorten in proportion as they appear to the eye.

For ſo much as it turns away from our eye, ſo much it loſes in proportion; nay, ſometimes a whole finger, two or three, or more, is loſt to our ſight, to which the draught muſt be made to anſwer.

V. In drawing of feet, the ſame rules are to be obſerv'd, that are laid down for drawing of hands.

Of DRAWING *the whole body.*

I. Begin with the head, and be ſure that you give it its juſt proportion, anſwerable to what you intend the whole body ſhall be; then draw the ſhoulders in their exact breadth, next to them the trunk of the body, beginning at the arm pits, and ſo drawing down to the hips on both ſides, obſerving withal the exact breadth of the waſte; and in the laſt place, draw the legs, arms and hands, according to your pattern.

II. Firſt draw with a coal, and alſo very lightly and faintly, not drawing any thing perfect (that it may be the eaſier mended when it is amiſs) and when this has been done, finiſh one thing after another as curiouſly as you can.

III. Let thoſe joints, ſinews, muſcles and veins which are parallel, be plac'd oppoſite to one another in a ſtrait line (as ſhoulder to ſhoulder, hip to hip, knee to knee, &c.) in order to this, draw ſtrait croſs lines for your guide; obſerving that which way ſoever the body turns or bows, theſe lines may anſwer accordingly.

IV. Place all perpendicular joints and parts in a right line one under another (as you ſee them in your pattern.) For which purpoſe, draw a ſtrait line (if the body be ſtrait) from the throat, through the middle of the breaſt and privities to the feet, to which line draw all thoſe particular points parallel, that the body may not appear crooked or awry.

V. In the bowings and bendings of the body, let the extuberance of the outward part be juſt equal to the compreſſion of the inward part, making all things of an equal proportion, that the oppoſite parts may be equal (as arm to arm, leg to leg, &c.) ſo every part may be proportional to each other (as the hand not too big for the arm, nor the arm for the body, nor the body for the legs, *&c.*) only with this difference, that (as the one part may appear fully to the eye, or the other may turn away, either in part or the whole, or be ſeen ſideways) it may be made ſo much leſs than the other, by ſo much as it turns away from the ſight.

VI. As a juſt proportion is to be obſerv'd in bigneſs, ſo alſo muſt it in length, ſo that every oppoſite part may not be too long one for another, but according to the propos'd magnitude; and in this caſe, that if the body be awry, or any ways hid, thoſe parts may ſhorten accordingly, to what is out of ſight.

VII. The juſt diſtance of one thing from another, for by that means you will be more exact in your draught, and be able in a little time to imitate either pattern or nature more perfectly.

VIII. If you draw a labouring man, you muſt repreſent him with ſtrong limbs and rais'd muſcles, ſwelling and ſtanding out; eſpecially in bearers of burthens, drawing of weights, leaping, walking, combating with weapons, or ſuch like violent exerciſes.

IX. In repreſenting perſons aſleep, you muſt carefully avoid giving any ſuch poſture or actions in their lying, as will not, in all probability, give them leave to ſleep. For the weakneſſes and want of judgment in the artiſt, will appear in repreſenting their limbs or bodies ſupported by their own force, and not by the help of ſome other thing.

Of DRAWING *a* NAKED BODY. In drawing after the life, as there are a great variety of faces, ſo no certain rules can be delivered for it; yet the following precautions may be of uſe.

I. Draw the *head* in an oval, one fourth part for the hair, one fourth part for the forehead and brows, one fourth for the noſe, and the laſt for the mouth and chin.

II. Having drawn the head, meaſure out eight times the length of it (the head making one of the eight parts) and draw a ſtrait line from the top of the head to the ſole of the foot.

III. Let there be one head's length from the chin for the breaſt, and the next eighth part will reach to the navel, the fourth part to the privities, the fifth part to the middle of the thigh, the ſixth part to the lower part of the knee, the ſeventh to the ſmall of the leg, and the eighth part to the heel.

IV. You muſt take care to draw the muſcles exactly as they are in the life; the breadth of the ſhoulders ſhould be about two meaſures of the head, the breadth of the hips two meaſures of the face; the arms as ſtretched out to their full length, are juſt the length of the whole figure, the breaſts alſo accounted; but without the breaſts they are but ſix.

V. The arms, when they hang ſtrait down, reach within a ſpan of the knee; the length of the hand is the juſt length of the face.

VI. Let the head be drawn firſt with the utmoſt exactneſs, and next to that the ſhoulders in their juſt breadth, after theſe draw the trunk of the body, and the reſt in order as before directed.

VII. Let the joints, muſcles, ſinews, *&c.* be all placed in their proper and natural places, and alſo be proportionable as to magnitude, ſimilitude and parts, leſt it ſeem crooked and deform'd.

VIII. Let every parallel joint have a moderate bending ſo as to anſwer its oppoſite in nature.

IX. It will be of great advantage to practiſe much drawing after the life, and after good prints of anatomy and ſtatues made of plaiſter of *Paris*, which is the only way to arrive at the perfection of drawing a naked figure well.

X. A picture ought alſo to be quick, free and lively; and if there be many of them in one piece, they ought to be ſo ordered as not to appear crowded, or to fall offenſively; but being diſpos'd gracefully (on the fore ground eſpecially) ſo to manage the whole, that the reſt of the figures decline and leſſen proportionably and gradually, both in magnitude, height and ſtrength according to their ſeveral diſtances.

DRAWING *of mixed and uncertain* FORMS.

1. In order to the drawing the form of any beaſt, begin at the forehead with the lead or coal, drawing downward the noſe, mouth, upper and nether chop, ending the line at the throat.

2. Then viewing it again where you begun, from the forehead over the head, ears and neck, continuing till you have given the full compaſs of the buttock; then mark out the legs and feet.

3. Viewing it again, touch out the breaſt with the eminency thereof; laſtly finiſh the tail, paws, tongue, teeth, beard and ſeveral ſhadows.

4. In drawing beaſts, you muſt be well acquainted with their ſhape and action, without which you will never perform any thing excellent in that kind; and here if you draw it in an emblem or the like, you ought to ſhew the landſcape of the country natural to that beaſt.

5. In birds begin alſo the draught at the head (and beware of making it too big) then bring the breaſt line, from under the throat, down to the legs, there ſtay and begin at the pinion to make the wing, which being joined to the back-line, will be preſently finiſh'd.

6. The eye, legs and train muſt be drawn laſt, always letting (in birds as in beaſts) the fartheſt leg be ſhorteſt, their feathers are the ſame to them as the hair in beaſts, and therefore muſt take their beginning at the head very ſmall, and fall in one way backwards in five ranks, greater and greater to the concluſion.

7. *Inſects*, as flies, bees, waſps, graſs-hoppers, worms and ſuch like are eaſily to be drawn and not hard to be laid in colours; in doing theſe it will at firſt be abſolutely neceſſary to have the living pattern before your eyes.

8. To *draw a flower* begin from the roſe-tuft or wart in the middle, as in a roſe or marigold, with the yellow tuft, which being made, draw lines equally divided from thence to the greateſt compaſs or extent of the flower.

9. They may be drawn either fully open or in the bud, and laden with dew, wet and worms, and then with the coal or lead, may be drawn rudely the leaves, giving them afterwards their veins or jaggedneſs.

10. To take the natural and lively ſhape of the leaf of any herb or tree.

Firſt take the leaf you would have, and gently bruiſe the ribs and veins on the backſide of it, afterwards wet the ſide with linſeed oil; and then preſs it hard upon a piece of clean white paper, and ſo you ſhall have the perfect figure of the ſaid leaf with every vein of it ſo exactly expreſs'd, as being lively coloured it will ſeem to be truly natural.

General obſervations on DRAWING.

1. In drawing well you muſt endeavour to make your compoſitions conformable to thoſe of the ancients, and their cuſtoms, yet having reſpect alſo to the preſent times.

2. Avoid whatſoever has no relation to the ſubject in hand, or that may not be proper to it, nor muſt you put into principal

places,

VIII.

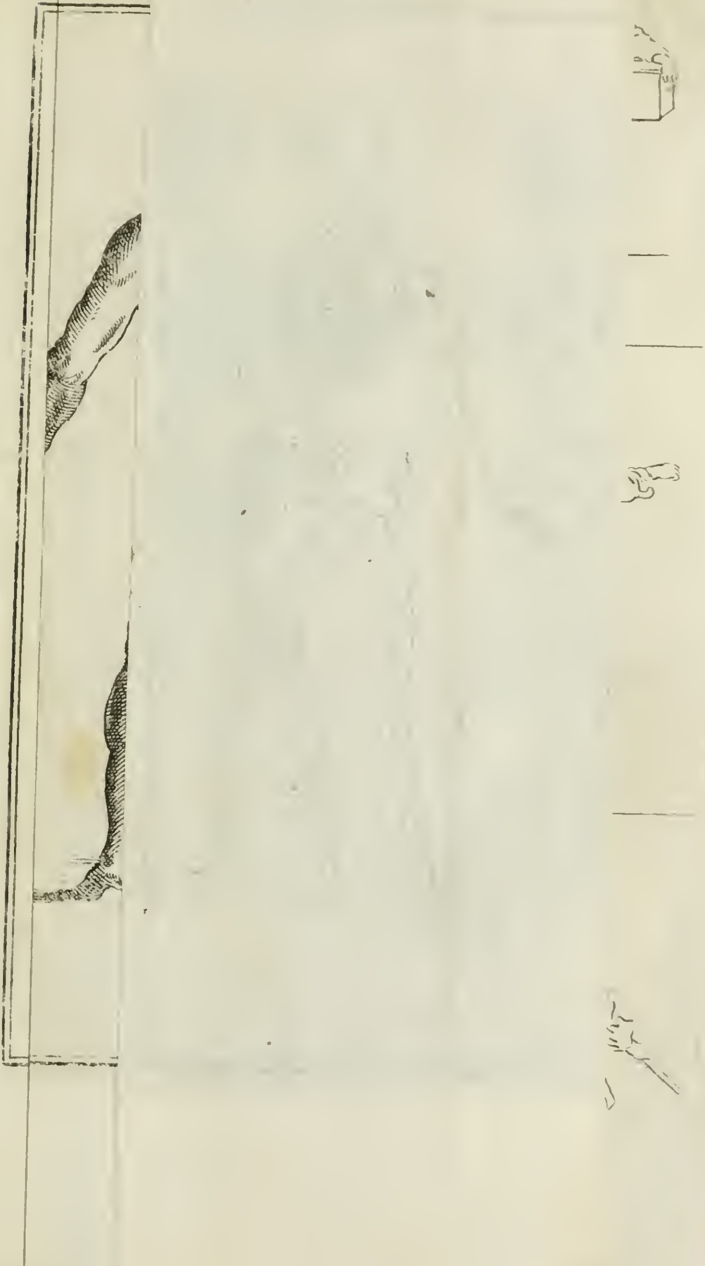
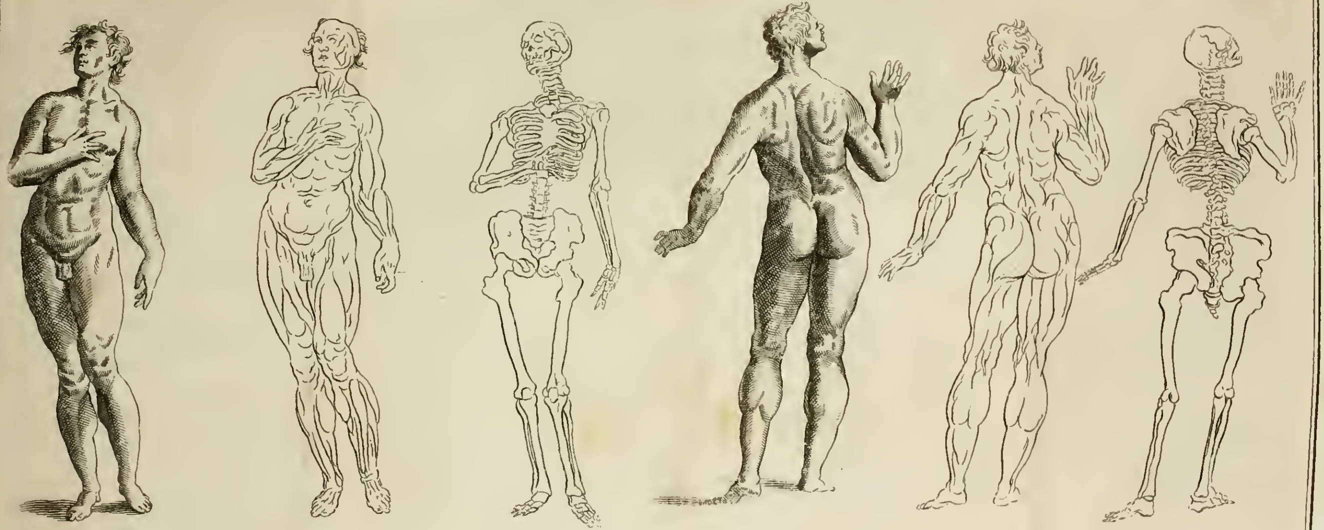


Plate. VII.



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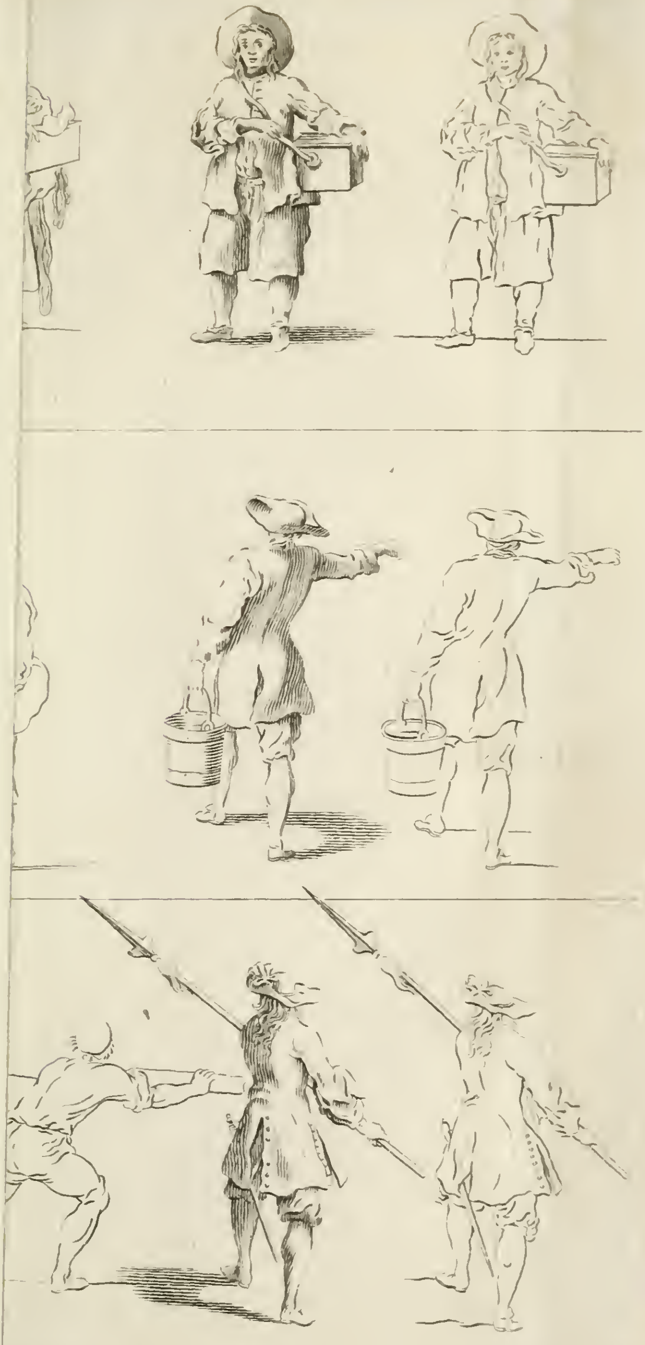

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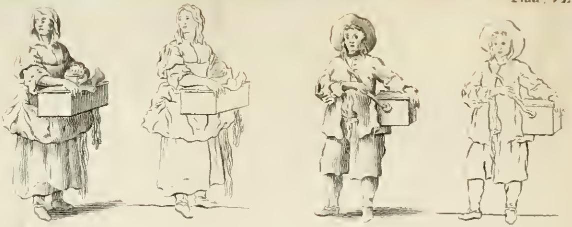

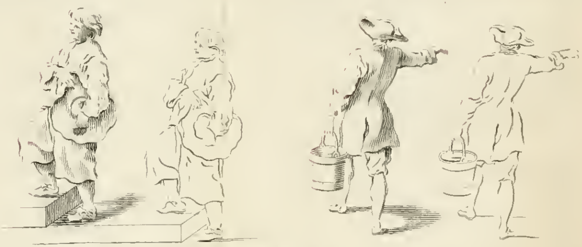

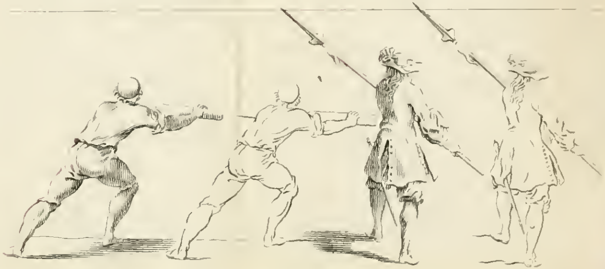

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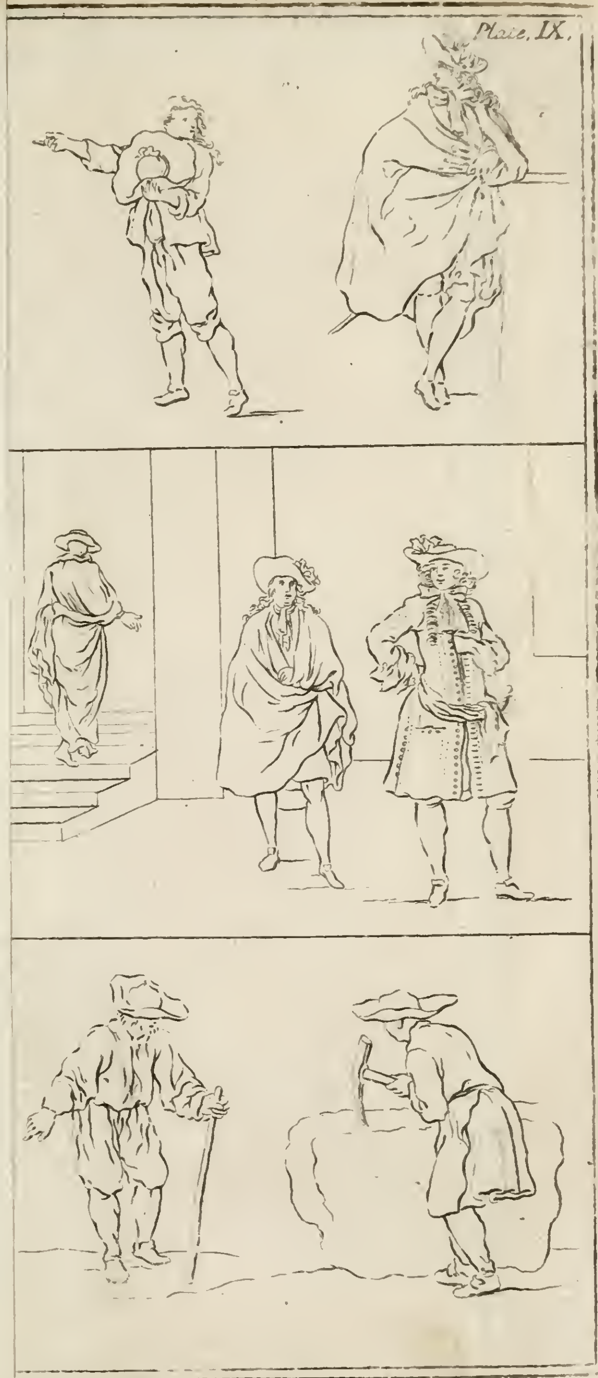

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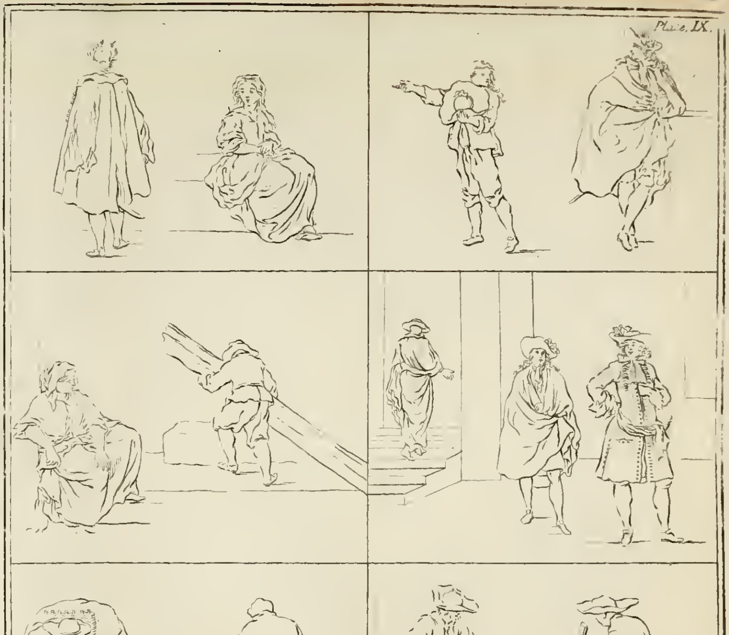


places, ſuch things as have but a ſmall relation to it; thoſe being to be reſerv'd for the minutes of the deſign.

3. In pictures neither the face, proportion, age nor colours are to be alike in all, but they are to be as different, as the true and living objects themſelves are.

4. Let your ſubject be beautiful and noble, furniſh'd with delights and charms, elegant, and pleaſing.

5. Let your invention be good, and the poſtures of your deſign agreeable and harmonious in reſpect to light and ſhadow, with the colours which are afterwards to be added, taking from each what may moſt conduce to the beauty of the work.

6. The principal part of the picture ought to appear in the middle of the piece under the ſtrongeſt light, that it may be more remarkable than the reſt, and not be hidden or obſcur'd from the ſight by other adjacent figures; yet ſo that all together may compoſe but one body with the drapery proper for the ſame.

7. All the members or parts of the figure ought to be combin'd or knit together in a kind of harmony, as the portions of the ſame part are, that no chaſm may appear to be left, which will diſgrace the work.

8. If there be crouds or heaps of objects, let them be made diſtinct by different poſtures and motions, which ought not to be alike, any more than their parts, nor ought they to be all on one ſide, but ſet as much as may be in oppoſition one to the other.

9. If among many figures, ſome ſhew their fore-parts, let others ſhew their hinder parts, oppoſing as it were the back or buttocks to the belly.

10. And if the piece contain many figures, let not one ſide of it be void or empty, while the other is fill'd to the borders; but let the parts and matter be ſo diſpos'd, that both ſides may equally participate of the amplitude of the deſign.

11. Let there not be too many figures in your piece, for it will not be poſſible to diſpoſe and introduce them into the work with ſuch a grace, as may make the whole beautiful.

12. Becauſe many diſpers'd objects breed confuſion, detracting from the work that elegancy and pleaſingneſs which ought to give pleaſure to the beholder.

13. But if the work is to conſiſt of many figures, you ought to conceive the whole deſign in your mind together; that when it is perform'd it may appear at the firſt view, as the product of perfect harmony, and as the real work of nature.

14. Such parts as are not eaſy to be ſeen, and are not natural and all forc'd actions and motions, alſo uncomely poſtures and parts, are to be wholly omitted.

15. You ſhould alſo avoid all out-lines, and other lines, which are either equal or parallel, or conſtitute any pointed or geometrical figure, whether triangles, ſquares, quinquangles, hexangles, &c. which by their exactneſs or ſeeming exactneſs ſpoil the natural beauty, and give diſpleaſure to the eye.

16. You are not to tie yourſelf up too ſtrictly to nature, but ſometimes you may give a looſe to the flights of fancy and your own genius; by which many times things are added to render the deſign much more beautiful.

17. Yet the beauties of nature are to be imitated, as has been done by the ancients; for which reaſon the whole univerſe is to be view'd and contemplated, to furniſh the mind with great and noble ideas, with which the work being adorn'd, they may be as ſo many charms upon the ſenſes, &c. of the beholders.

18. If the piece has but one ſingle figure, it ought to be perfectly finiſh'd in all its parts; the drapery ſweetly ſpread over it; the folds large and following the order and motion of the parts, that they may be ſeen, as it were, *underneath* by the lights and ſhadows appendant.

19. If the parts be too much diſtant from each other, ſo that there are void ſpaces left, place there ſome fold or folds which muſt be deeply ſhadowed, to conſtitute a ſeeming joining (as it were) of the parts.

20. The beauty of drapery conſiſts not in the multitude of the folds, nor the beauty of limbs in the quantity and riſing of the muſcles; but rather in their natural order and ſimplicity.

21. The management of the *drapery* is to be taken from the quality of the perſons, if it be of a clown or ſlave, it ought to be conciſe and ſhort; if of magiſtrates, bold and ample; if of ladies, light, ſweet and ſoft.

22. Folds are ſometimes to be drawn out from hollows and deep ſhadows, to which you are to give a ſwelling, that receiving the light, it may, as it were, extend the clearneſs to thoſe places where the body requires it, and ſo thoſe hard ſhadowings, which are ever ungraceful, will be avoided.

23. In laying the ſcene of the picture, you are to conſider the places ſuppos'd, the countries where brought forth, the manner of their actions, with the uſe and cuſtoms belonging to them.

24. You are to follow the order of nature; as in drawing or painting clouds, lightening, ſun-ſhine, &c. to place them towards the top of the piece, not towards the bottom; and contrariwiſe in putting-wells, waters, caves, foundations, &c.

25. The lights and ſhadows of round bodies ought to be lively and ſtrong, but in their turnings, they ought to loſe themſelves inſenſibly, and confuſedly, without a ſudden or abrupt precipitation of the light, all of a ſudden, into the ſhadow, or the ſhadow into the light.

26. But the paſſage of one into the other ought to be eaſy, ſweet and imperceptible, that is, they are to change gradually the light to ſlide (as it were) into the ſhadow, and the ſhadow into the light.

27. In the ſame manner, as if you would manage a ſingle head or figure, you muſt (in conformity to theſe precepts) draw a heap of figures compos'd of ſeveral parts.

28. And where you have ſeveral heaps of figures (which ought not to exceed three or four) you muſt take heed, ſo to place or ſeparate them from each other, that they may be plainly diſtinguiſh'd, by lights, ſhadows or colours.

29. And theſe things ought to be manag'd ſo dextrouſly, that the bodies may appear inlightened by the ſhadows, which bound the light and not be permitted ſuddenly to go farther; and on the contrary the ſhadows ſhould be made evident, by enlightening the ground.

30. A round body ſhould be drawn in the ſame manner that we behold it in a convex mirrour, in which the figures and all other things are ſeen to bear out with more life and ſtrength, than even nature herſelf.

DRAWING, } By theſe terms are ſometimes underſtood
DESIGNING, } the expreſſing our thoughts upon paper, or whatever other flat ſuperficies; and that by reſemblances form'd by a pen, crayon, chalk, or the like. But more commonly, the giving the juſt form, and dimenſion of viſible objects, according as they appear to the eye; if they are pretended to be deſcrib'd in their natural dimenſions; if not, but bigger or leſſer, then *Drawing* or *Deſigning*, ſignifies only the giving thoſe things their true form, which implies an exact proportionable magnifying, or diminiſhing in every part alike.

And this comprehends alſo giving the true ſhapes, places, and even degrees of lights, ſhadows, and reflections; becauſe if theſe are not right, if the thing has not its due force or relief, the true form of what is pretended to be drawn cannot be given; theſe ſhew the out-lines all round, and in every part, as well as where the object is terminated on its back-ground.

In a compoſition of ſeveral figures, or whatever other bodies, if the perſpective is not juſt, the *Drawing* of that compoſition is falſe. This therefore is alſo imply'd by this term. That the perſpective muſt be obſerv'd in the *Drawing* of a ſingle figure cannot be doubted.

I know *Drawing* is not commonly underſtood to comprehend the *clair-obſcure*, *relief*, and *perſpective*, but it does not follow, however, that what I advance is not right.

But if the out-lines are only mark'd, this alſo is *Drawing*; 'tis giving the true form of what is pretended to, that is, the out-line force.

The *Drawing* in the latter, and moſt common ſenſe, beſides that it muſt be juſt, muſt be pronounc'd boldly, clearly, and without ambiguity; conſequently, neither the out-lines, nor the forms of the lights and ſhadows muſt be confus'd, and uncertain or woolly, (as painters call it) upon pretence of ſoftneſs; nor on the other hand, may they be ſharp, hard or dry; for either of theſe are extremes; nature lies between them.

As there are not two men in the world, who at this inſtant, or at any other time, have exactly the ſame ſet of ideas; nor any one man that has the ſame ſet twice, or this moment, as he had the laſt: for thoughts obtrude themſelves, and paſs along in the mind continually as the rivers ſtream, and perpetually draw their humid train; *Milt.* So neither are there two men, nor two faces, no, not two eyes, fore-heads, noſes, or any other features: nay farther, there is not two leaves, though of the ſame ſpecies, perfectly alike.

A *Deſigner* therefore muſt conſider, when he draws after nature, that his buſineſs is to deſcribe that very form, as diſtinguiſh'd from every other form in the univerſe.

In order to give this juſt repreſentation of nature, for that is all we are now upon, as being all, that *Drawing*, in the preſent ſenſe, and ſimply conſidered implies; (*grace* and *greatneſs* is to be ſpoken of afterwards) I ſay in order to follow nature exactly, a man muſt be well acquainted with nature, and have a reaſonable knowledge of *geometry*, *proportion*, (which muſt be varied according to the ſex, age, and quality of the perſon) *anatomy*, *oſteology*, and *perſpective.* I will add to theſe, an acquaintance with the works of the beſt painters and ſculptors, ancient and modern; for 'tis a certain maxim, no man ſees what things are, that knows not what they ought to be.

That this maxim is true, will appear by an academy figure drawn by one ignorant in the ſtructure, and knitting of the bones, and anatomy, compared with another who underſtands theſe thoroughly; or by comparing a portrait of the ſame perſon drawn by one unacquainted with the works of the beſt maſters, and another of the hand of one to whom thoſe excellent works are no ſtrangers; both ſee the ſame life, but with different eyes; the former ſees it, as one unskilled in muſick hears a conſort, or inſtrument, the other as a maſter in that ſcience; theſe hear equally, but not with like diſtinction of ſounds, and obſervation of the skill of the compoſer.

Perhaps *Albert Durer* drew as correctly, according to the idea he had of things, as *Rafaelle*, and the *German* eye ſaw (in one ſenſe) as well as the *Italian*; but theſe two maſters conceiv'd differently; nature had not the ſame appearance to both, and that becauſe one of them had not his eyes opened to ſee the beauties that are really there.

Michael Angelo was the moſt learned, and correct deſigner of all the moderns, if *Rafaelle* were not his equal, or as ſome will have it ſuperior. The *Roman* and *Florentine* ſchools have excell'd all others in this fundamental part of painting; and of the firſt *Rafaelle*, *Giulio Romano*, *Polydore*, *Pierino del Vaga*, &c. as *Michael Angelo*, *Leonardo da Vinci*, *Andrea del Sarto*, &c. have been the beſt of the *Florentines*. Of the *Bologneſe*, *Annibale Carracci*, and *Dominchino* have been excellent deſigners.

When a painter intends to make a hiſtory (for example) the way commonly is to *Deſign* the thing in his mind, to conſider what figures to bring in, and what they are to think, ſay or do; then to sketch upon paper this idea of his, and not only the *invention*, but *compoſition* of his intended picture: this he may alter upon the ſame paper, or by making other sketches, 'till he is pretty well determin'd as to that; (and this is that firſt ſenſe in which I ſaid the term *Drawing* or *Deſigning* was to be underſtood.) In the next place his buſineſs is to conſult the life, and to make *Drawings* of particular figures or parts of figures, or of what elſe he intends to bring into his work, as he finds neceſſary; together alſo with ſuch ornaments, or other things of his invention, as vaſes, friezes, trophies, &c. till he has brought his picture to ſome perfection on paper. This is frequently done, and ſometimes theſe *drawings* are finiſh'd very highly by the maſter, either that his ſcholars might be able from them to make a greater progreſs in the grand work, and ſo leave the leſs for himſelf to do; or becauſe he made advantage of ſuch *drawings* from the perſon who employ'd him, or ſome other; and perhaps ſometimes for his own pleaſure.

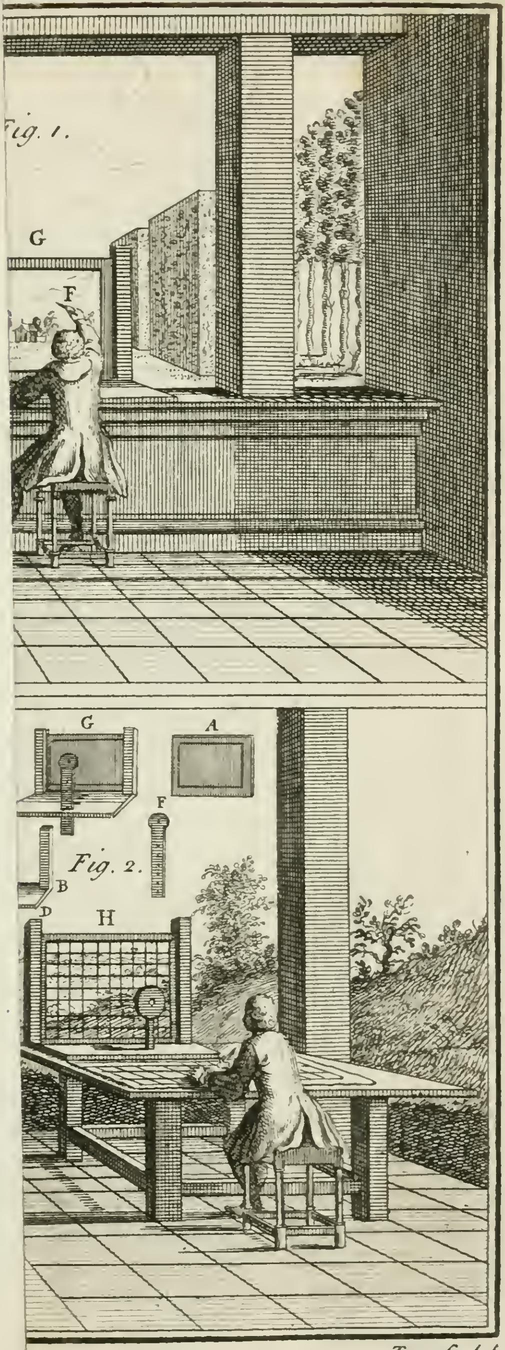
Of theſe *drawings* of all kinds, thoſe great maſters made a great many; ſometimes ſeveral for the ſame thing, and not only for the ſame picture, but for one figure, or part of a picture; and though many are periſh'd and loſt, yet a conſiderable number have eſcap'd and been preſerv'd to our times, and theſe are exceedingly valued by all who underſtand, and ſee their beauty, for they are the very ſpirit and quinteſſence of the art; there we ſee the ſteps the maſter took, the materials with which he made his finiſh'd paintings, which are little other than copies of theſe, and frequently (at leaſt in part) by ſome other hand; but theſe are undoubtedly altogether his own, and true, and proper originals.

It muſt be confeſs'd, in the paintings you have the colours, and the laſt determination of the maſter, with the entire completion of the work. The thoughts and finiſhings are in a great meaſure ſeen in the prints of ſuch works of which prints are made, nor is a *Drawing* deſtitute of colouring abſolutely; on the contrary, one frequently ſees beautiful tints in the paper, waſhes, ink, and chalks of *drawings*; but what is wanting in ſome reſpects is abundantly recompenſed in others; for in theſe works the maſters not being embarraſs'd with colours have had a full ſcope, and perfect liberty, which is a very conſiderable advantage, eſpecially to ſome of them. There is a ſpirit and fire, a freedom, and delicacy in the *drawings* of *Giulio Romano*, *Polydore*, *Parmeggiano*, *Battiſta Franco*, &c. which are not to be ſeen in their paintings: a pen or chalk will perform what cannot poſſibly be done with a pencil; and a pencil with a thin liquid only what cannot be done when one has a variety of colours to manage, eſpecially in oil.

And there is this farther conſideration to endear thoſe *drawings* we have to us; no more can be had than what are now in being; no new ones can be made; the number of theſe muſt neceſſarily diminiſh by time, and accidents, but cannot be ſupply'd; the world muſt be content with what it has: for though there are ingenious men endeavouring to tread in the ſteps of theſe prodigies of art, whoſe works we are ſpeaking of, there is yet no appearance that any will equal them; though I am in hopes that our own nation does, or will produce thoſe that will come as near to them as any other, I mean as to hiſtory-painting, for that we excel all others in portraits is indiſputable.

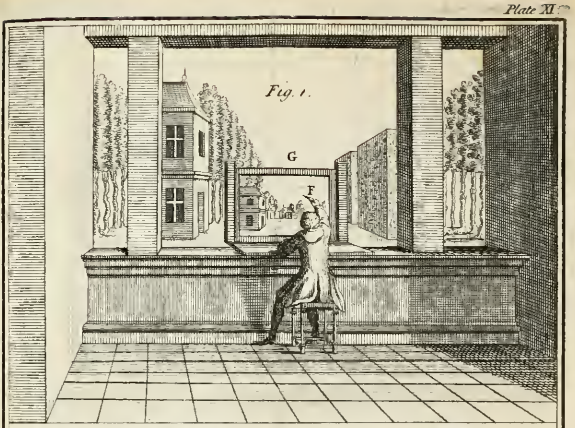
I ſhall only add, that the firſt sketches not being intended to expreſs more than the general ideas; any incorrectneſs in the figures, or perſpective, or the like, are not to be accounted as faults; exactneſs was not in the idea, the sketch, notwithſtanding ſuch ſeeming faults, may ſhew a noble thought, and be executed with a vaſt ſpirit, which was all pretended to, and which being perform'd, it may be ſaid to be well drawn, although incorrect as to other matters. But when correction is pretended to, (and this is always the caſe of a finiſh'd *Drawing* or picture) then to have any defect in *Drawing*, in this ſenſe of the term, is a fault.

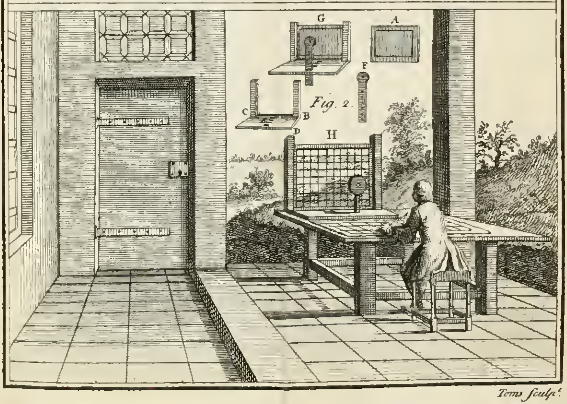
A very curious method of DRAWING *all* PERSPECTIVE *in the moſt natural manner, without obſerving the rules.* It may be of good ſervice to ſuch as love painting; and take pleaſure in practiſing the ſame, without being willing to be at the pains of opening the compaſſes or taking up the ruler to draw lines. For in this method neither the one nor the other are requir'd; and yet the fineſt draughts may be made hereby of buildings, gardens, landſcapes, *&c.* See plate, fig. 1.



Toms sculp.

Plate XI.





Toms sculp.

Before we come to the method itſelf it muſt be obſerv'd that the principal requiſite therein is a large piece of fine clear glaſs, fitted into a fine wooden frame, expreſs'd at the bottom of the plate by letter A.

This frame is to ſlide between two cheeks or pieces of wood an inch and half thick, which are rais'd at the two extremes of a board the breadth of the frame, i. e. about a foot broad, as ſhewn in B C, which is diſpos'd to receive the frame A.

In the middle of the board one or more ſquare holes muſt be made as in E to receive the ſlit ruler F, ſo as it may be raiſed or lowered at pleaſure. At the top of which ruler is a circle of three or four inches diameter; but no thickneſs, being made of tin or the like and having a little aperture about the ſize of a pea in the middle, the whole is repreſented together in G.

Now though the mere figure ſhews the application, yet I will deſcribe the method of proceeding.

Having therefore plac'd the inſtrument G before the object you would draw, look through the little hole or ſight F, and if you ſee all the propos'd objects repreſented on the glaſs, the inſtrument is fix'd, otherwiſe bring the ſight nearer the glaſs, till you ſee the whole of what is requir'd.

The piece being thus rectified, you are to draw on the glaſs every thing that you ſee thereon through the hole F, which has the ſame effect here as the point of ſight in other methods. And it is certain, that every thing thus drawn on the glaſs, the eye being fix'd to the little hole, will be according to the ſtrict rules of perſpective.

Every body knows how to take or copy off what is thus deſign'd on the glaſs. 'Tis beſt to draw the lines and figures on glaſs with pen and ink; then wetting the back ſide of the glaſs a little, and laying a moiſt ſheet of paper on the ſide that has the deſign; rub or preſs the paper gently thereon, and the whole draught will be impreſt or transferr'd from the glaſs upon the paper.

Some adviſe to make uſe of a pencil and colours; but in ſhort every body is left to their own diſcretion, it is enough to know the method in general.

A deſign of a palace is as eaſily taken this way as a landſcape; and a church as a houſe or chamber; all requir'd in any of them being to pitch on a place where the whole thing to be repreſented may be ſeen; and to bring the ſight to the proper nearneſs to the glaſs. A painter may uſe the ſame method for the drawing of figures, poſtures, &c. from nature, ſtatues, relievo's, and in ſhort every thing; it being certain that a little practice will render the method exceeding feaſible and eaſy. See plate, fig. 1, 2.

Another

Another elegant manner of DRAWING *in perſpective.* This method is as curious as the former; and ſome even prefer it, by reaſon there is a double draught requir'd in that; one on the glaſs, and a ſecond copied or imprinted from it; whereas in the preſent method, only a ſingle draught is made, and that as exactly as the former.

I ſhall not deſcribe the ſtructure of this inſtrument; it being the ſame with that already mentioned, excepting that the frame inſtead of the glaſs fitted in it, muſt be divided into a number of little ſquares by fine threads; drawn at equal diſtances from each ſide of the frame acroſs each other, forming what we call a *reticula* or lettice. See plate, fig. 2.

As to the number of ſquares that is left to diſcretion, all that is neceſſary to be added, is, that they muſt not be too large, that you may work the more exactly; nor too ſmall for fear of being confus'd.

For the practice; place the piece H in ſuch manner, as that you may ſee all the objects you mean to deſign through the hole of the ſight I.

If the deſign ſhould be larger than the compaſs of the frame or *reticula*, your chequer ſquares muſt be made on the cloth or paper larger than thoſe of the frame.

If the deſign be intended ſmaller on the cloth, *&c.* than the frame, make the ſquares leſs; otherwiſe they are to be of the ſame ſize.

But in all the caſes make the ſame number of ſquares on the paper, *&c.* as are in the frame when you look through the ſight I.

Thus transferring proportionably from the ſquares in the one to the correſponding ones in the other; the perſpective will be as juſt, as if you had gone by the ſtrict rules, and us'd the compaſs, ruler, *&c.*

The two figures ſhew how the piece H is to be placed in order to deſign on a table, the expedient is of excellent uſe in painting, and ſerves to draw very exactly any perſpective draught, to copy paintings, draw to the life, *&c.* See plate, fig. 2.

Short rules for drawing in perſpective.

If we obſerve the faults daily committed in the deſigning of landſcapes, or drawing views and proſpects, the knowledge of ſomething of perſpective, in order to correcting and avoiding ſuch errors, for the underſtanding that art, will render any one capable of drawing any thing with mathematical truth and certainty.

It may reaſonably be believ'd, that ſo many miſtakes as are commonly made in drawings proceed from the apprehenſions that ſome have of the length of time, it will take up to render themſelves maſters of perſpective, and by being frightened at the difficulties, they conceive are in that ſtudy; imagining that it is abſolutely neceſſary that a perſon muſt be well grounded in the mathematicks, before he can acquire a competent knowledge in perſpective.

This having diſcourag'd many from engaging the rein, the rules relating to this art, has given occaſion to the giving the following leſſons, how to lay any plan in perſpective, and raiſe pillars or buildings to due heights according to their proper diſtances.

For the firſt leſſon of the plan. See fig. 1.

Suppoſe you have a ſquare piece of pavement, as in fig. 1, conſiſting of twenty five pieces of marble, each a foot ſquare, it muſt be meaſured exactly, and laid regularly down upon paper; you may likewiſe for your better obſervation, mark every other ſtone or marble black, which will better inform you how every particular ſquare will appear, when you have a true perſpective view of them; or elſe you may number every one, and when the ſecond or following leſſon is done number thoſe in the perſpective plan, with the ſame figures as are mark'd on the firſt plan.

Leſſon II. *of laying the figure* 1. *in perſpective.* See plate, fig. 2.

It is to be underſtood in perſpective, that there are two points to be conſidered, the firſt is call'd the point of ſight. See POINT of SIGHT in letter P, that is what relates to every thing in our view, from the place where we ſtand to take our view; for the perſpective will ſtill be true, according to the appearance of the plan to our eye; if we ſtand at a corner, or in the middle, or at any point, the method I ſhall preſcribe preſently, will lay the plan juſtly before you, as it will appear. See plate, fig. 2.

The other point is call'd the point of diſtance, becauſe it governs the diſtances, and the proportions of every thing we can truly ſee of the plan, in whatever poſition we happen to be. See POINT of DISTANCE in letter P.

At A you ſee the plan of figure 1, this is divided into ſquares, as mentioned in that figure, the three at the bottom mark'd B C D, in both, and the ſquares in the plan A mark'd 1, 2, 3, 4, are thoſe which are mark'd in perſpective with the ſame numbers.

Now to lay your plan in perſpective, fix your point of ſight, as you obſerve in the figure, more or leſs to the right or left as you think proper; then draw the line K K, parallel to, and at what diſtance you will from the line L L; then raiſe a line from each ſide from L to K, to form the figure you ſee, as a frame to your picture; then draw a line from the corner K, which is the point of diſtance to L, and this line will regulate the work.

Then

Then draw lines from the ſquares of the plan to the point of ſight, as exactly as poſſible, and wherever the line of diſtance cuts thoſe lines, which are drawn from the ſquares of the plan to the point of ſight, that marks where your ſquares in perſpective ought to be; then draw lines parallel to the line L L, where the line of diſtance cuts, and that will give you the true figure of every ſquare; ſo D in the perſpective plan, anſwers to D in the meaſured plan, and 1, 2, 3, 4, anſwers to the others in the ſame.

When you have done this, the next rule you are to know, is to know how to raiſe either pillars, trees, houſes or any other bodies, according to their reſpective heights at different diſtances and proportion, on the plan you have laid down

Leſſon III. *figure* 3. *How to raiſe pillars or any bodies of a certain proportion in perſpective.*

Your plan being now meaſured out in perſpective, into ſquares of a foot, one of theſe ſquares in this leſſon ſerves for the baſe or bottom of a pillar a foot thick; the figure 3 in the plate is exactly of the ſame dimenſions of the plan laid in perſpective at figure 2.

Firſt mark the line L K in equal proportions, by the ſame ſcale of the ground plan, figure 2, as *a b c d*, which are ſo many feet in height, and they ſtanding on the baſe of the firſt figure, are upright, not in perſpective; then draw a line parallel with L I, from number 4 which gives you the front of the body you are to raiſe; and if it is to be only three feet high, draw a line croſs from C to the line rais'd from number 4, and that determines the height, which you will then find to be a foot high by meaſure; then from the top of the line 4 draw a line, with a black lead pencil, to the point of ſight, and raiſe another line from 3 parallel to the line 4, till it touches the pencil'd line, paſſing from 4 to the point of ſight, which gives you the ſide appearance of the column or body, as you will ſee it in the place where you ſtand [the line from the point 3 ſhould be drawn with a pen, becauſe it is to remain] then with a pencil draw a line from C to the point of ſight, which will determine the other line, to make the ſhape of the top of the column; and then raiſe a line parallel with L I, with a pencil, from the point 2, till it touches the line from C to the point of ſight.

Then draw a parallel line to C 5 at 6, 7, and you will have the ſquare of the top of the pillar or column, as you can obſerve it from the place where you ſtand, which is ſuppos'd to be at A.

You muſt remember, that the line drawn from 2 to 6 is only an imaginary line, to be rubb'd out; for it cannot be ſeen from the place of ſtanding, and therefore muſt not appear in the drawing; but it ſhould not be left out, becauſe it ſhews you to regulate the top of the column.

Plate X.

1.

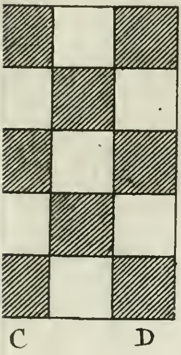
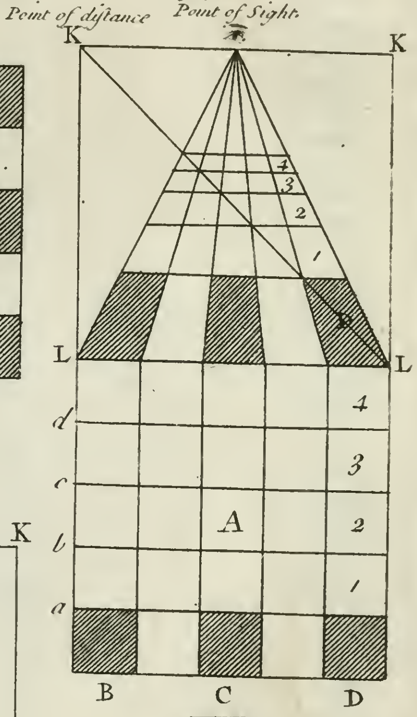


Fig. 2.



g. 3

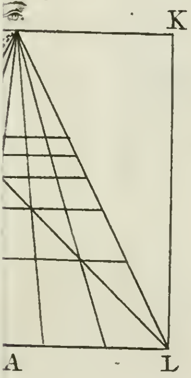


Fig. 4

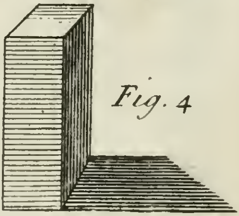


Fig. 1.

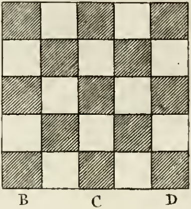


Fig. 2.

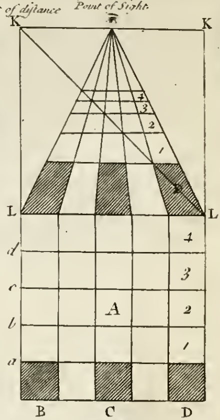


Fig 3

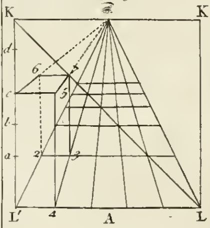
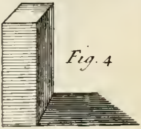


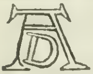
Fig. 4



DRYADES [ſo call'd of Δρὺς Gr. an oak, as having their beginning with trees and dying again with them]

They are repreſented as beautiful virgins; but not ſo fair as the *Napeæ*; but of a brown and tawny complexion, having their hair thick like moſs, and their habit of a dark green colour.

GASPARO DUGHET, born in 1600, liv'd at *Rome*, and excell'd in landſcapes; he died in the year 1663.



ALBERT DURER, born in the year 1471, ſcholar of his father and *Michael Wolgemuth*, liv'd at *Nuremburg*, excell'd in hiſtory painting, portraits, perſpective, and ſculpture, died in the year 1528, aged fifty ſeven years. He us'd this mark, and A E in a very few plates.

John Burchinayr Auguſtano made uſe of the former mark; and *Matthew Grunewald* of *Aſchaffemburg*, who was cotemporary with *Durer*; as alſo *Mark Anthony Raimondi*, in the life of *Chriſt*, copied from that of *Albert Durer*, for which the latter accus'd him before the ſenate of *Venice*.

BRASS DUST. This is commonly call'd *gold duſt*; the beſt (which comes from *Germany*) is that which is the brighteſt and moſt gold like colour, which is to be perceiv'd by taking a little of it between your finger and thumb, and rubbing them together; if it be good, it will be of a bright, rich, golden luſtre; if bad, will be of a dull, clayiſh colour.

The coarſer ſort works well with gold ſize; but not with gum-water. It is of different prices, according to the goodneſs; the beſt is worth twelve or fourteen ſhillings the ounce, when at the ſame time ſome other ſorts are not worth above four or five ſhillings the ounce. The middle ſort, which is worth eight or nine ſhillings the ounce, will work well.

Silver DUST. The beſt of this comes from beyond ſea, having a lively bright luſtre, like that of poliſh'd or new coined ſilver, which is to be perceiv'd by rubbing it between your finger and thumb; whereas the worſer ſort (which is made in *England*) is dull, dead, and heavy, more fit for a colour than a metal. The difference is eaſily perceived by comparing them together.

The beſt is worth ſixteen ſhillings the ounce; the other counterfeit is not valuable.

Green GOLD DUST is an adulterated or mixt metal, caſting a kind of dead, greeniſh colour, and is worth about ſix ſhillings the ounce.

This, as alſo the following, are us'd in garments, flowers, houſes, and the like, making the work more beautiful and ſurprizing.

Sullied or dirty coloured GOLD DUST is alſo a kind of adulterated metal, bearing ſome reſemblance to droſſy gold. The price is ſix ſhillings the ounce, and is us'd for the ſame occaſions as the former.

Tin DUST *or* POWDER is made of block tin ground to powder, and is of a dull, dark, but ſilveriſh colour; it is us'd in rocks, *&c.* and is ſold for ſix ſhillings an ounce.

Natural copper DUST is made of *copper* ground, without mixture to duſt. This is of the true natural colour of copper, and is ſold for ſix or ſeven ſhillings the ounce.

Artificial copper DUST. This exceeds the natural, and is more deep or red; but very clear, and of a bright ſhining colour, and ſhews how far art can out-do nature. It is ſold for about ten ſhillings the ounce.

Adulterated copper DUST is of a thick, heavy, dull, metallick colour, and commonly us'd to work other metals on; for being laid as a ground, you may *hatch* or heighten with bright gold, or other ſhining metal, and is ſold for about ſix ſhillings an ounce.

Sir ANTHONY VAN DYCK was born at *Antwerp*, *anno* 1599, and *Rubens* (his maſter) fearing he would become as univerſal as himſelf, to divert him from hiſtories, uſed to commend his talent in painting after the life, and he kept him continually employed in buſineſs of that nature, ſo that he reſolved at laſt to make it his principal ſtudy; and for his improvement, went to *Venice*, where he attained the beautiful colouring of *Titian*; *Paulo Veroneſe*, &c.

After a few years ſpent at *Rome*, *Genoa*, and *Sicily*, he returned home to *Flanders* with a manner of painting, ſo noble, natural, and eaſy, that *Titian* himſelf was hardly his ſuperior, and no other maſter in the world equal to him in portraits.

He came over to *England* ſoon after *Rubens* had left it, and was entertained in the ſervice of King *Charles* I. who conceived a marvellous eſteem for his works, honoured him with knighthood, preſented him with his own picture ſet round with diamonds, aſſigned him a conſiderable penſion, ſate very often to him for his portrait, and was followed by moſt of the nobility and principal gentry of the kingdom.

He married one of the faireſt ladies in the *Engliſh* court, daughter to the Lord *Ruthen* Earl of *Gowry*, and lived in grandeur anſwerable to her birth. His own garb was generally rich; his coaches and equipage magnificent; his retinue numerous and gallant, and his table very ſplendid, and ſo much frequented by people of the beſt quality, that his apartments rather ſeemed to be the court of a prince, than the lodgings of a painter. He being deſirous of immortalizing his name, went to *Paris* in hopes of being employed in the grand gallery of the *Louvre*; but not ſucceeding there, returned hither, and propoſed to the King (by his friend Sir *Kenelm Digby*) to make cartoons for the banqueting houſe at *Whitehall*, the ſubject of which was to have been the inſtitution of the order of the *Garter*, the proceſſion of the Knights in their habits, with the ceremony of their inſtallment, and St. *George*'s feaſt. But his demands of 80000 *l.* being thought unreaſonable, whilſt the King was treating with him for a leſs ſum, the gout and other diſtempers put an end to that affair and his life, *anno* 1641, being aged forty-two years, and his body was interr'd in St. *Paul*'s church.

DYING of cloth, ſtuff, ſilk, skins, bones, *&c.* See under the proper articles of the colours *black*, *white*, *red*, *blue*, *green.*

E.

THE EAST is repreſented in painting by a pretty youth with golden locks, a ſplendid ſtar over his head, in a ſcarlet robe interwoven with pearl; his girdle is embroidered with *Aries*, *Leo*, and *Sagittarius*, holding flowers in his right hand juſt ready to bloſſom. The ſun riſen, the verdant, pleaſant plants, and birds warbling out their notes; in his left hand a perfuming pot.

Youth denotes that this is the infancy of time; the golden locks, the ſun-beams; the ſtar is Lucifer; the jewels, that they come from the eaſt; the flowers, that the ſun beams appearing in the eaſt, the fields ſmile, and the flowers open; the perfuming pot ſhews, that ſweet odours come from thence.

EASEL is an inſtrument or frame made of wood, much like a ladder, with ſides flat, and full of holes, to put in two pins to ſet the work higher or lower at pleaſure for the *eaſe* of the artiſt, whence doubtleſs it took its name; on the backſide of it there is a ſtay, by which it may be ſet more upright or ſtooping.

EASEL PIECES with painters are ſuch ſmall pieces, either portrait or landskips, as are painted on the Eaſel, *i. e.* the frame whereon the canvaſs is ſtrain'd.

They are thus call'd to diſtinguiſh them from larger pictures drawn on walls, ceilings, &c.

EBONY, a kind of wood brought from the *Indies*, exceedingly hard and heavy, and taking a very fine poliſh, and on that account us'd in *Moſaic* and inlay'd work.

There are divers kinds of *Ebony*; the moſt uſual among us are *black*, *red*, and *green*, all of them the product of the iſland of *Madagaſcar*, where they are called by the natives indifferently *hazon mainthi*, q. d. *black wood.*

The iſland of *St. Maurice* belonging to the *Dutch* likewiſe furniſhes part of the *Ebonies* us'd in *Europe.*

Authors and travellers give very different accounts of the *black Ebony* tree. The moſt authentick of them is M. *Flacourt*, who reſided many years at *Madagaſcar*, as governor of it. He tells us the tree grows very high and large, its bark black, and its leaves reſembling thoſe of our myrtle, of a deep, dusky green colour.

Tavernier ſays, that the iſlanders bury their trees when cut down to make them the blacker.

Pliny and *Dioſcorides* ſay, the beſt *Ebony* comes from *Ethiopia* and the worſt from *India.*

Black Ebony is much preferr'd to that of other colours; the beſt is of a jet black, free of veins and rind, very maſſive.

It yields an agreeable perfume when laid on coals; it contains much of an unctuous quality, and thence eaſily takes fire, when burnt while green.

It is now much leſs us'd among us than it was formerly, ſince the diſcovery of ſo many ways of giving other hard woods a black colour.

As to *green Ebony*, beſides *Madagaſcar* and *St. Maurice*, it grows alſo in the *Antilles*, and eſpecially in the iſle of *Tobago.*

The tree that yields it is very buſhy; its leaves ſmooth, and of a fine green colour.

Beneath its bark is a white rind about two inches thick; all beneath which to the very heart, is a deep green, approaching towards a black, tho' ſometimes ſtreak'd with yellow veins.

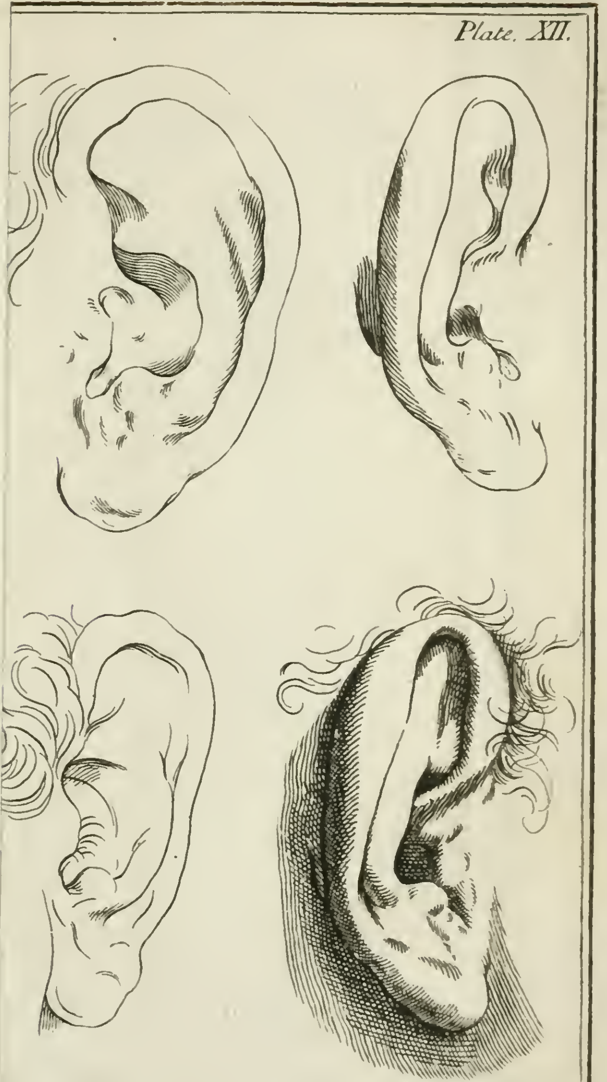
Its uſe is not confin'd to *Moſaic* work; but 'tis likewiſe uſeful in dying, as yielding a fine green tincture.

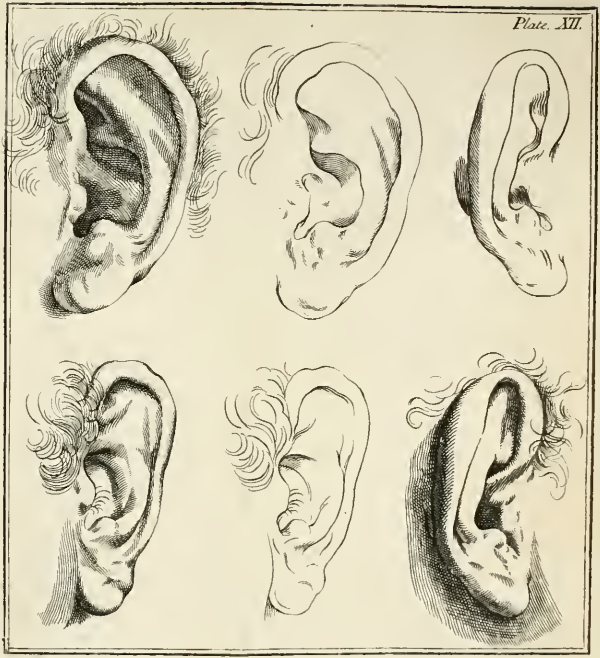
As to *red Ebony*, alſo call'd *Grenadilla*, we know little of it more than the name.

Cabinet-makers, inlayers, *&c.* make *pear-tree* and other woods paſs for *Ebony*, by *ebonizing*, or giving it the black colour of it.

This is done by ſome by a few waſhes of a hot decoction of galls, and when dry'd, by adding writing-ink on it, and poliſhing it with a ſtiff bruſh and hot wax.

GERRARD EDEMA was a landſcape painter born at *Amſterdam*, and diſciple of *Everdine*, whoſe manner he at firſt followed. He came over into *England* in the year 1670, and became very famous for landſcapes; his manner was afterwards broad and bold, in imitation of ſome *Italian* pictures. His pictures commonly afford a ſcene of clifts, caſcades, and views (as the learned Dr. *Burnet* in his theory calls it) of a broken world; he choſe a country uncultivated, full of rocks and falls of water, the latter of which he never failed to expreſs well, diſperſing a gentle





gentle warmth throughout the whole, to make amends for the horror of the proſpect which generally repreſents *Norway* or *New-found-land*, places in which he ſtudied as *Everdine* his maſter did before him; after whom there are extant many prints, expreſſing a country wild and rude. Mr. *Edema* died in *Surrey* about the year 1700, in the 40th year of his age.

EDUCATION is repreſented in painting by a lady at full age, clothed in a cloth of gold; a ray ſhining upon her, ſhews her turgid breaſt; holding a rod in one hand, ſeeming to teach a child to read; on her left ſide a pale fixed in the ground, with a tender young plant tied thereto, which ſhe embraces with her right arm.

The ray ſignifies, that the grace of God is neceſſary, and that God gives the increaſe; the breaſts denote the principal parts of Education, to teach candidly, and to communicate; the rod correction; the tender plant, her endeavour to direct and ſet ſtrait, and to teach good manners.

To make a deep EGMARINE. Take nine drams forty-eight grains of powder of *Cryſtal*, three drams twenty-four grains of *verdegreaſe*, and one ounce five drams and twenty-four grains of our fine ſalt of *tartar*; the whole reduc'd into fine powder in a braſs mortar, and then bak'd as is directed elſewhere. See AQUA or AIQUE MARINE.

ELECTION is repreſented in painting by an antient venerable dame in a decent habit, a gold chain with a heart that ſeems to have noble and lofty notions; on her right ſide a flouriſhing oak, on her left a ſerpent; pointing with her fore-finger at the tree; ſhe holds a label with this motto, *Virtutem Eligo.*

Old, and of a noble aſpect, becauſe experience of things ſeen and practiſed, is able to make a true choice; the heart denotes counſel; the tree, virtue, as being firm, deep and verdant; the *Romans* gave a crown of it to valiant captains.

ELEGANCE of painting is not founded on the correctneſs of the deſign, as appears in *Raphael* and the *Antique.* It is moſt ſenſibly perceiv'd in works otherwiſe careleſs and inaccurate; as in *Correggio*, where notwithſtanding all the defects as to juſtneſs of deſign, there is an elegance even in the manner of the deſign itſelf, as well as in the turn of the attitudes, *&c.*

The *Elegance* of a deſign is a manner of Being, which embelliſhes and heightens objects, either as to their form or colour, or both, without deſtroying or perverting the truth.

To make the FOUR ELEMENTS *appear in a glaſs.* Take jet in fine powder an ounce and a half, oil of *tartar per deliquium* (made without any addition of water) two ounces, coloured of a light *green* with *verdegreaſe*; add thereto ſpirit of *wine*, tinged with a light blue, with two ounces of *indigo*; of the beſt rectified ſpirit of *turpentine*, ting'd of a light red, with two ounces of *madder*; mix all theſe in a glaſs, and ſhake them together, and you will ſee the heavy *black jet* fall to the bottom, and repreſent the earth. Next the oil of tartar made green falls, repreſenting the water: upon that ſwims the *blue* ſpirit of wine, repreſenting the air or sky; and uppermoſt of all ſwims the red oil of *turpentine*, repreſenting the element of fire.

It is ſtrange to ſee, how after ſhaking all theſe together they will be diſtinctly ſeparated one from another.

ELEMI ⎫ As *gum Elemi* is a pellucid reſin of a whitiſh
ELEMY ⎭ colour, intermixt with yellowiſh particles, which give it much the colour and conſiſtence of wax.

It is call'd *gum Elemi*, but improperly, inaſmuch as it takes fire readily enough, and diſſolves in liquors of an oily quality, which are the characters of roſin.

It flows from inciſions made in the trunk, and large branches of a kind of olive-tree, growing in *Ethiopia* and *Arabia Felix*. It is alſo found in the *Pouille*, a province of the kingdom of *Naples*.

Pomet and *Lemery* in their treatiſe of drugs, deſcribe *Elemi* as a white roſin, bordering on green, odoriferous, and brought from *Ethiopia*, in cakes of two or three pounds a piece, wrapp'd up in the leaves of the *Indian* cane.

The true *gum Elemi* is that above deſcrib'd; but there are ſeveral ſpurious ones, ſome natural, and others factitious, frequently ſold for the ſame.

The factitious or counterfeit is made of roſin, waſh'd with oil of *aſpic*; tho' the ill-ſmell and white colour might eaſily diſcover the deceit. The natural gums vended for *Elemi* are,

1. A gum brought from the *American* iſlands in barrels of divers weights, cover'd up with the leaves of a plant unknown in *Europe*.

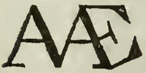
2. The next might be taken for *roſin*, but for its ſmell, which is ſomething ſweeter, and more aromatick.

3. Another is of an aſh colour, bordering on brown, brought over in large pieces, very dry and friable.

Pomet does not take any of them for natural; but rather ſuppoſes them to be originally *Elemi*, only impure and coarſe, ſince melted down and made up by fire.

ELIZABETH, Queen of *England*, is painted with a pale countenance, light brown hair and gray eyed.

ELSHEIMER



ADAM ÆLZHEIMER, who work'd with *Peter Bruguel*, engrav'd his plates with this mark, was born in the year 1574, diſciple of *Philip Uffenback*, ſtudied at *Rome*, excell'd in hiſtory, landſcape, and night pieces, died in the year 1610, aged thirty-ſix years.

EMBOSSING } is the act of forming or faſhioning works
IMBOSSING } in relievo, whether they be caſt or moulded, or cut with a chiſſel.

Emboſſing is one great part of ſculpture; being that which has to do with figures rais'd or prominent from the plain or ground. The other part which makes figures that are indented or cut in below the ground, is call'd *Engraving*.

Rais'd and EMBOSS'D WORK.

1. You muſt firſt make the model of your deſign, and that is to be done with clay.

Take good, tough, well temper'd clay, and model it with proper toolls, and work out any ſort of carving or *Emboſſment*, as your fancy leads you; then lay it aſide to dry in the ſhade, for either ſun or fire will crack it.

2. When it is grown perfectly dry and hard, and you purpoſe to caſt the moulds on the models, oil your models very well with linſeed oil; and having wrought the *paſte* extremely well between your hands, clap it on and preſs it down cloſe every where, that it may be a perfect mould in all parts, which, when it is dry, is finiſh'd.

To make the paſte for making moulds.

Make a glue-water ſtronger than any *ſize*, yet not quite ſo ſtrong as joiners melted glue; mix with it whiting finely powdered, of as thick a conſiſtence as paſte and dough; knead it very well, wrapping it up in a double cloth, that it may lie in it and get heat from the fire, for you muſt not let it grow cold; for, if ſo, it will harden, and be rendred unfit for uſe.

To make the mould of any carved frame, thereby to imitate it in paſte.

Take ſome of the before-mentioned *paſte*, according to the length and largeneſs of the leaves and flowers you would take off; you need not take off a whole length, for probably there may be the ſame thing ſeveral times over on one ſide, ſo that one mould may ſerve all of that ſort, they being well united or join'd together.

Work the paſte between your hands, and clap it in that part of the frame you intend to take a mould off.

Let there be ſo much of the paſte as ſhall ſuffice to make the back of the mould flat and even, and while the mould is warm, take it from the frame, and the ſame inſtant fix it to a board, which is larger than it ſelf.

After this manner you may take off any ſort of emboſs'd work or carving from any part of your frame; all which moulds may be glued on little boards, and ſo ſet by to dry and harden.

To place the paſte on frames.

The frames are to be made by a joyner, which being ready, and alſo the paſte and moulds, theſe laſt muſt be very well oil'd with linſeed oil, ſtriking the bruſh into every little crevice and corner, to prevent the moulds from ſticking to the paſte.

Then take a quantity of the warm paſte, ſufficient to fill up the moulds, and it being well work'd between your hands while it is warm and in good temper, apply it to the mould, preſſing all parts of it with your thumbs and fingers; and then with a knife, cut off the ſuperfluous paſte even with the top of the mould.

Then turn out this new-faſhion'd emboſs'd or carv'd work on your hand, and bruſh it over with thin glue before it is cold, and alſo the place it is deſign'd for, and immediately put it upon your frame, in the ſame place where it muſt always remain, preſſing it gently down.

Then oil your mould again, and with freſh paſte make more emboſſments or carv'd works in like manner, which caſt off and place on your frame as before, repeat this ſo often till your whole frame is fill'd with theſe emboſſments.

Let it ſtand to dry for five or ſix days, or a week; and then you may venture to lay your white ground on it, upon which you may *paint*, *varniſh*, *gild* in oil or *burniſh* as you pleaſe.

Another way to make rais'd or Emboſs'd works.

1. Make a ſtrong gum Arabick water, take whiting, fine bole, of each one ounce; grind theſe with a ſufficient quantity of the gum water, till they are as fine and ſoft as butter, and ſo thin that if a pointed ſtick be dipt into it, the mixture will juſt drop from it; if it proves too thick, you may thin it with gum water; and if it be too thin, it may be thickened with whiting and bole.

2. Dip this pointed or taper ſtick into this mixture, and drop on the rock-houſe-tree, flower or fruit, what you would rinſe or *Emboſs*; repeating the dropping of this mixture ſo often, till the work is rais'd as bold or as high as you would have it.

3. Sometimes you will find your paſte to bladder or ſwell; this is caus'd by an inſufficient grinding of the whiting and bole with gum water.

Theſe bladders, if they are not prevented or remov'd, will cauſe the work when dry to be full of holes, and will ſpoil its beauty.

To cure this, when it is dry, take a fine rag, and with your finger rub it over and over again, till the holes and cracks are ſtopp'd up; and when it is dry, *ruſh* it well till it is very ſmooth.

4. In the *Japan* that is rais'd for garments, rocks, *&c.* ſome parts are elevated and higher than others; as in plaits and foldings of garments, thoſe which ſeem to lie underneath, are always at the greater diſtance.

In *flowers* thoſe which are firſt and neareſt the eye are higheſt, and thoſe leaves which lie firſt are higher than thoſe which lie behind them.

So in *rocks*, the firſt and neareſt muſt always be rais'd higher, and ſwell beyond that which is almoſt hidden or ſeems to lie behind.

5. *This rule holds in all things of like quality*, and therefore the deſign muſt be rais'd, according to nature to its due height, whether *figure*, *tree*, *houſe*, *flower*, *fruit*, or *landſcape*; and being well dry'd with a little gumwater, vermilion, and a pencil, you muſt trace out the lines for the face, hands, foldings of garments, leaves of plants, ſeeds of flowers, fruits, houſes, trees, rocks, *&c.* in their proper ſhape, according to thoſe lines, which were drawn as boundaries, for laying the paſte in its proper figures.

6. You muſt be provided with ſeveral inſtruments, as, firſt, a bending graver, ſuch as is us'd by engravers; ſecondly, ſeveral ſmall chiſſels, the broadeſt not exceeding a quarter of an inch; all the other proportionably leſs.

7. With theſe you muſt cut, carve, clear, and ſcrape your rais'd or Emboſs'd works in height, ſhape and proportion to your pattern, or what is agreeable to nature and the deſign.

Theſe inſtruments muſt be exquiſitely ſharp, and your hand very exact, eaſy and gentle, leſt you ſhould break off the work in any place, and ſpoil the piece; laſtly, ſmooth it with a bruſh that has been often us'd before to make it fit for painting, *varniſhing*, *japanning*, or gilding.

Another way to perform theſe Rais'd or Emboſs'd works.

1. Strike or trace out the deſign, as well the inſide, as the out-ſide of faces, necks, hands, legs, the chief ſtrokes of the *foldings of garments*, *leaves of plants*, *flowers*, *ſeeds*, *fruits*, *houſes*, *trees*, *rocks*, *birds*, *beaſts*, &c.

2. Take the paſte before-mentioned, but ſomething thinner, and with it raiſe the lower parts of all, or any of the particulars before-named, which require the leaſt height or raiſing, and let it dry thoroughly.

3. Then take the *thickeſt ſeed lack varniſh*, and with a very ſmall or fine pencil dipt in it, varniſh juſt the edges of your rais'd work, becauſe that as you raiſe the other parts of the work higher, it may hinder the freſh wet paſte from incorporating with the dry, which would make the work look ill.

4. This work of varniſhing the edges muſt be done as often as one part is rais'd above another; and ſtill as the work grows higher, the paſte muſt be made thicker, and each part rais'd in order, beginning with the loweſt, and ending with the higheſt.

5. When all is dry (if need requires) it muſt be ſmoothed with a ruſh, to make it fit to receive the colours and metals, or what elſe you are pleas'd to put upon it.

6. Mix your metalline colours with gum water, and lay them on the Emboſſments, and places where they ought to lie, and when they are thoroughly dry, burniſh them with a burniſher, till it is bright and ſhines with a good luſtre.

7. Having done this, go over all your Emboſſments with a *fine ſeed lack varniſh*, and a proper pencil twice or thrice, and then ſet it off or ſhadow it at diſcretion.

8. You ought not to make any more of this paſte than you can uſe at once, that it may not dry before you uſe it again; for if it be dry, you muſt grind it again, and then it will be as fit as before.

Nor ought it to be made too weak; and if it be, it muſt be ſtrengthened with more gum water, which you may fully find out at length by many trials and experiments.

And you will find it is poſſible to make a paſte ſo ſtiff and tough, that a violent blow with a hammer ſhall hardly break or bruiſe it.

To ſet off rais'd or EMBOSS'D *work with black.*

1. Having varniſh'd and burniſh'd your work with lamp-black, mixt with a little gum water (hardly enough to wet it, and incorporated with a bruſh pencil with ſo much fair water added to it, as with a ſmall well pointed pencil will make it to run in fine black ſtrokes) draw the lineaments and features of the faces, ſoldage of garments, veins of leaves, flowers and ſeeds, with the black hatchments of your flowers, bodies of trees, *&c.*

2. And if you would ſpeckle any rocks, firſt paſs them over with the ſaid black; and when they are dry, give them two waſhes with the ſecuring varniſh, and then lay on the ſpeckles.

But if the places deſign'd to be ſpeckled ſhould be too ſlippery, ſo that there is danger of their ſliding off, in this caſe the greaſy kind of ſlipperineſs muſt be taken away by rubbing the places gently with a ſoft *tripoli* cloth.

3. This way of ſetting off is more in uſe, than that of a tracing pencil or breathing on it; not only for rais'd or *Emboſs'd* work; but the flat work too: for your piece being dry, ſtrake it once over with the *ſecuring varniſh*; and then hatch and vein it at pleaſure with a black-lead pencil, and do the ſame with other metals and colours beſides gold.

4. For inſtance; if a red flower is to be ſet off with *ſilver*, firſt ſecure the red with varniſh; and when that is dry, hatch and vein it with ſilver, this rule is to be obſerv'd in all caſes, where one thing is to be wrought upon another, whether *colour* upon *metal*, or *metal* upon *colour*; or metal ſometimes upon metal.

5. The work being thus adorn'd and ſet off, if the work be flat or plain, make uſe of white *poliſhing varniſh* to ſecure it both as to draught and ground work, which will endure a poliſhing.

6. But if the work be emboſs'd or rais'd; then the *ſecuring varniſh* is to be us'd, becauſe *Emboſt* work will not bear a poliſhing, as the flat work will; but muſt only be ſecur'd and clear'd up.

But the laſt nam'd *varniſh* may be us'd either for *flat* or *emboſs'd work*, whereas the former is only fit for flat work.

7. If you work in gum water you muſt take care that it be not too ſtiff of the gum; if ſo, it will ſpoil the beauty and luſtre of the metalline colours; but it may eaſily be weaken'd with fair water; if it be too ſtiff, you ſhould only make it juſt ſtiff enough with gum, as may make them ſtick cloſe to the work, and endure varniſhing without coming off.

The way of performing rock-work.

1. Theſe, as has been ſaid, are to be done laſt of all, becauſe they cannot be well finiſh'd till the reſt are compleated, except only ſome few ſcattered plants, ſuppos'd to grow upon them, that they may not appear naked; nor yet muſt there be too many of them neither, leſt their number ſhould interrupt the ſhadow and confound the ſight.

2. If theſe rocks are to be cover'd with metalline colours; then lay *gold*, *ſilver* or *copper* with your pencil, in a full body round the outward ſtreaks (that were trac'd with the pencil) in breadth about a quarter of an inch; but be ſure that it be not too wet.

3. Then cut off the point of a large gooſe quill pencil, to make it flat and blunt at the end, and with that touch or dub your metal; and after that do the like to the black or brown part of the rock, that ſo it may be ſtrew'd with ſome of the metal too, and continue it by little and little till the whole is ſtrew'd over; but theſe *ſpeckles* ſhould be thicker towards the ſides and tops, than in or near the middle.

4. Other metals, artificial and adulterate, may be laid on according to theſe directions.

EMERALD is a precious ſtone, very green and tranſparent and the next in hardneſs to the ruby.

Pliny reckons up twelve kinds of *Emeralds*, and denominates each from the Provinces or Kingdoms, where he ſuppoſed them to be found, as *Bactrian*, *Scythian*, *Egyptian*, *Perſian*, &c.

But the modern jewellers diſtinguiſh them but into two kinds, *viz.* the *oriental* and *Peruvian.*

Tho' *Tavernier* denies, that there is or ever was any mine of *Emeralds* in the *Eaſt-Indies*, and that all that are found there are brought thither from *Peru* by the way of the *South Sea*; which was a method of commerce carried on by the inhabitants of *Peru*, before the diſcovery of *America* by the *Spaniards*; yet this commerce not being fully prov'd, we ſhall keep to the diſtinction of *oriental* and *Peruvian.*

The *oriental Emerald* is harder, more brilliant, and tranſparent than the *Peruvian*, which has generally clouds found in it, and ſparkles leſs.

And beſides, there are ſuch quantities brought from *Peru* by the way of *Carthagena*, that the value and reputation of them is much ſunk.

The *Emerald* is ſuppos'd to grow more and more perfect in the mine like the ruby, and to arrive at its greenneſs by ſlow degrees.

It is a common opinion that the *Emerald* grows in the *jaſper*, and it is certain there are ſome *jaſpers* ſo perfectly green, that they have by many been taken for *Emeralds.*

The proper matrix or marcaſite of this ſtone is the *preme* which is reckoned among the coarſer precious ſtones; being hard, tranſparent, half opake, and uſually intermixt with yellow, white, green, blue, *&c.*

Some authors make mention of ſeveral *Emeralds* of incredible magnitude; as a table which King *Tarik* had for his ſhare of the plunder of *Toledo*, a table three hundred ſixty-five foot long, and all of a piece, which was an emerald. And *Theophraſtus* relates, that he had ſeen in a temple in *Egypt* one of four cubits long, and three broad; and alſo ſome mention an obelisk of *Emerald* forty foot high.

Some authors are of opinion, that *Emeralds* are taken out of iron-mines. And *Pomet* aſſerts that he had one to which the iron ore was ſtill ſticking.

Some tell us of Emeralds found in *Cyprus*, and even in *Great Britain*; but if there are of them any true ones at all, they are not conſiderable.

In M. *Savary*'s *dictionary de commerce*, there is the following accurate eſtimate of the values of the different kinds of *Peruvian* Emeralds, as follows:

Rough EMERALDS.

Thoſe of the firſt and coarſeſt ſort called *Plaſmes* for grinding are worth twenty-ſeven ſhillings ſterling the mark, or eight ounces.

The *demi-morillons* eight pounds ſterling per mark.

Good morillons, which are only little pieces, but of fine colour, from thirteen to fifteen pound *per* mark.

Emeralds larger than *morillons*, and call'd of the third colour or ſort, are valued at from fifty to ſixty pounds *per* mark.

Emeralds call'd of the *ſecond ſort*, which are in larger and finer pieces than the preceding, are worth from ſixty-five to ſeventy-five pounds *per* mark.

Laſtly, thoſe of the *firſt colour*, otherwiſe call'd *negres cartes*, are worth from a hundred and ten to a hundred and fifteen pounds *per* mark.

Emeralds ready cut or poliſh'd, and not cut, being of good ſtone and a fine colour, are worth:

	l.	*s.*
Thoſe weighing one caract or four grains	00	10
Thoſe of two caracts	1	7
Thoſe of three caracts	2	5
Thoſe of four caracts	3	10
Thoſe of five caracts	4	10
Thoſe of ſix caracts	7	10
Thoſe of ſeven caracts	15	00
Thoſe of eight caracts	19	00
Thoſe of nine caracts	23	00
Thoſe of ten caracts	33	00

To make a paſte for an oriental EMERALD.

It is ſhewn elſewhere under the article GLASS of LEAD. The way of tinging *cryſtal* and *glaſs of lead* of a very fair *Emerald* colour, or to make a ſtone that ſhall imitate a true natural gem, which may be us'd in rings or otherwiſe.

There are divers ſorts of *Emeralds*, but at preſent they are all diſtinguiſh'd into *oriental* and *occidental*; the oriental ones are the harder of the two, and the occidental leſs ſo.

To imitate them there are ſeveral ways as follows:

Take two ounces of natural *Cryſtal* prepar'd as directed, and four ounces of common minium or red lead, powdered and ſearc'd, and forty-eight grains of *verdegreaſe* well pounded and of a good colour, with eight grains of *crocus martis* prepar'd with vinegar. See the article CRYSTAL.

Mix the whole well together, and put it into a good crucible that will reſiſt the fire, leaving an inch of it empty.

Then cover the crucible with an earthen cover, lute it well, let it be dried, and then put it into the hotteſt place of a potter's furnace, where they bake their earthen veſſels, and let it ſtand as long as their pots.

When it is grown cold, break the crucible, and you will find within a matter of the colour of a very fine *Emerald*; which if ſet in gold, will ſurpaſs in beauty the true oriental *Emerald*.

If it happens that your matter is not enough refined and purified, you muſt ſet it in again the ſecond time into the ſame furnace, where it will be purified as much as it need to be; which may be known by lifting up the cover, if the matter appears ſhining.

If it is not ſo, lute the cover on again, and put the whole into the furnace.

You may obſerve this once for all, that you muſt not break the crucible, before the matter is thoroughly bak'd and puriſy'd; for if you do, and ſo are oblig'd to put the matter into another crucible, the paſte will be painted and full of bliſters.

If you cannot eaſily have the conveniency of uſing a potter's furnace, you may make one your ſelf with a little charge, wherein you may put twenty crucibles at once, each of different colours; ſo one baking may ſerve for a great deal of matter.

You muſt make uſe of hard wood to dry and heat the furnace, as is alſo directed in the baking of glaſs, and continue the fire twenty-four hours, in which time the matters ought to be bak'd and purified enough; but for more ſurety, you may continue the fire ſix hours longer, and they will be certainly bak'd enough.

The matter being thus rightly bak'd, you may have it poliſh'd at the wheel, and ſet it in a foil in gold, as is done with true gems, and you will have an emerald brighter than the oriental.

Another deeper EMERALD *colour.*

That which makes *Emerald* deeper than the precedent, proceeds from the ſmaller quantity of *cryſtal* employ'd in it, with more of the other materials, which make it indeed more fair; but at the ſame time more brittle.

You muſt bake it at leaſt ſix hours longer than the preceding, to take away that imperfection, which lead uſually gives.

The doſe of this paſte is, one ounce of natural cryſtal prepared, ſix ounces and a half of red-lead, ſeventy-five grains of verdegreaſe, ten grains of *crocus martis* made with vinegar; the whole pulveriz'd and well mixt together. Then proceed as directed in the article preceding; only let the matter ſtand longer in the fire, and you will have an admirable oriental *Emerald* colour, which being ſet in gold with a foil of the ſame metal underneath, will be inexpreſſibly fair.

Another way to make a fairer paſte for EMERALDS.

This paſte will be as brittle as the preceding for the reaſons before given; for you muſt take ſeven ounces of *minium*, to two ounces of natural *cryſtal* prepar'd; to which add full eighteen grains of verdegreaſe, ten grains of *crocus martis*; the whole pulveriz'd and well mix'd.

Then proceed as directed before, and you will have an *Emerald* fit for all ſmall works; but not ſo hard as the former, by reaſon of the great quantity of lead in it. Therefore it ought to be kept longer in the fire, that the pale colour of the lead may vaniſh.

Another fairer paſte for EMERALDS.

The colour of this paſte will ſurpaſs the others in beauty, if there be care taken in the operation.

Take two ounces of natural *cryſtal* prepar'd, ſix ounces of *minium* in powder, and eight grains of *verdegreaſe* alſo in powder; mix the whole well together; then put them into a large crucible, cover'd and well luted, and ſet it in the furnace as before directed, and do all as directed in the firſt article, and you will have an extraordinary fair *Emerald* colour.

Another very fair EMERALD *colour.*

This ſtone will be far harder and finer than the preceding.

To make it, take four ounces of natural *cryſtal* prepar'd, a quarter of an ounce of red-lead, and the ſame quantity of *verdegreaſe*; pulverize the whole, and ſift it fine; put them together into a crucible well clos'd and luted in the furnace, as before directed, letting it ſtand there for thirty-ſix hours.

After which, if you will, you may caſt your melted matter into a marble mould heated, putting it near the fire to cool gently, and you will have a very fine *Emerald.*

Another way of making a fair EMERALD.

Take two ounces of *cryſtal*, add to it forty-eight grains of *crocus martis*, and two ounces and forty-eight grains of pure ſalt of *tartar* prepar'd; the whole reduc'd into fine powder in a braſs mortar; put theſe into a crucible covered with another, lute them well together; then ſet it into a glaſs-houſe fire, and bake it for twenty-four hours, and then in the annealing furnace for twelve hours, that the matter may cool by little and little, which then take out of the crucible, and you may cut and poliſh, and you will have a perfect *Emerald.*

Another oriental EMERALD.

Take ten ounces of the prepar'd matter call'd *Saturnus glorificatus*, (which ſee in letter S) and natural *cryſtal* half an ounce, half an ounce of prepar'd *verdegreaſe*, half a dram of *feretto* of *Spain* alſo prepar'd; reduce all into fine powder; mix them well together; put them into a crucible covered with another; lute it, and let it dry; then ſet it in a glaſs-houſe furnace for three days, and afterwards in the annealing furnace for twelve hours. Then break the crucible, and you'll find the matter ting'd of a very fine oriental *Emerald* colour, which cut and poliſh.

To make glaſs of lead of a fair EMERALD *colour.*

The eaſineſs of tinging glaſs of lead of any colour is the reaſon of giving it an excellent *Emerald* green, eſpecially becauſe green is alſo natural to it.

Take twenty pounds of *cryſtal fritt* powdered and ſearced, and ſixteen pounds of *calx of lead* alſo ſifted; mix them well together; then put them by little and little into a pot heated in a furnace, and in eight or ten hours time it will be melted; then caſt the melted matter into water, and carefully take the remaining lees from it; then put the matter after it is dry'd in the ſame pot again, and in ſeven or eight hours time it will be melted again.

Repeat this of caſting the melted matter into the water, and ſeparating the lead that ſticks to the pot, as before; then this glaſs will be cleanſed and purified from all the foulneſs and unctuoſity the calx and powder would leave in it, and be very reſplendent.

You muſt put it again into the pot, where it will melt and purify again in a little time.

When it is melted, put to it ſix ounces of ſcales of *copper* thrice calcin'd in powder, with twenty-four grains of *crocus martis*, made with vinegar, alſo in powder, and mix them together.

This powder muſt be caſt in at ſix times, always mixing the glaſs well, and taking at each time an interval of time, as long as while you may repeat over the *creed:* let it reſt for one hour, and then ſtir it again, and examine if the colour be to your mind; if it be, let it ſtand eight hours, that the whole may well incorporate.

Then ſtir it well, and let it reſt a little, that the *fæces* may precipitate to the bottom of the pot; then it may be wrought, and the colour can ſcarce be diſtinguiſhed from true *Emerald.*

Another way of making a fairer EMERALD.

For this colour, which will be far fairer than the former, you muſt change one ingredient in the foregoing, and inſtead of ſcales of copper thrice calcin'd, put the ſame doſe of *caput mortuum* of *vitriolum veneris* prepar'd; then proceed exactly as before directed and you will have a very excellent green.

To make a green EMERALD *colour in glaſs.*

Take common glaſs well purified from its ſalt without *manganeſe;*

ganeſe; put it into a pot in the furnace, and when it is well melted and purified, add to it (as for example) to the proportion of an ounce and half of *crocus martis*, calcin'd with vinegar to fifty pounds of glaſs. Mix well the glaſs at the ſame time to make it incorporate with the *crocus*; then let it ſtand an hour, that it may thoroughly take the colour.

This way nothing will come out yellowiſh, and it will looſe that foulneſs and blueneſs, which the common metal always has, and it will become green.

Then add to the ſame doſe fifty pounds of glaſs, one pound of ſcales of copper thrice calin'd, and put it in at ſix divers times, mixing it well each time with the glaſs, and let it ſtand two hours to imbibe the tincture.

After the two hours are expir'd, ſtir it again, and ſee if it be as you would have it; if the colour be too blue, you muſt add to it ſome *crocus martis* prepar'd, and you will have a very fine *Emerald* colour.

Another EMERALD *green fairer than the preceding.*

The more pure the matter is, the finer the work will be that is made with it.

Take cryſtal fritt without *manganeſe*, which has been twice waſh'd in water, to take out all the ſalt, and put it in a pot in the furnace; then add to it half the quantity of common white metal, alſo without *manganeſe.*

Theſe two matters being well melted, mix'd and purified, put to fity pound of metal, a pound and a quarter of powder of copper plates thrice calcin'd, prepar'd with one ounce of *crocus martis* calcin'd and reverberated with ſulphur.

After you have mix'd them well together, then put in thoſe powders at ſix different times, ſtirring well the matter each time, obſerving what has been ſaid in the preceding.

You may make the colour lighter or deeper as you pleaſe, adding *crocus martis*, if it be too blue; and calcin'd powder of *Venus*, if it be not enough ſo, and ſo you will have from this a *Burnet green.*

Another wonderful green.

Altho' this colour is admirable, yet it is only made of common glaſs made with *pulverine*, and without *manganeſe.*

This being well melted and purified, you muſt put in equal parts of powder of ſcales of *copper* thrice calcin'd, and ſcales of iron which fall from the ſmith's forge or anvil, without any other preparation than well waſhing them, to cleanſe them from aſhes and coals that mingle with them; afterwards dry them well, and pound them as fine as you can, and ſearce them. Theſe ſcales ſerve inſtead of *crocus martis.*

You muſt obſerve the doſes and way of proceeding, as has been before directed as to *Emerald* colours.

Theſe ſcales of iron will give an admirable green; and they will drive out all the dull, natural green, which is in common glaſs, and make it become yellowiſh, or will give it a yellow green, very bright and fair.

Another oriental EMERALD *green, finer than the reſt.*

Put four pounds of common fritt of *pulverine*, five pounds of common white glaſs pulveriz'd, five pounds of cryſtal fritt well waſh'd; add to theſe three pounds of *minium*, mix them all together, and in a little time they will be pretty well purified.

Afterwards caſt all that metal into water to purify it more, taking care that no part of the lead ſink to the bottom of the pot wherein it is caſt, for it will break it, if ſpeedy care be not taken to take up again what is precipitated.

This glaſs being thus waſh'd and afterwards dry'd, ought to be put into the pot again, to be melted and purified for the ſpace of a day; then you muſt add to it a little of the *caput mortuum* of *vitriol of Venus*, without corroſive, (ſee VITRIOL) with a little *crocus martis*, ſtirring the metal, and proceeding, as has been ſhewn in the preceding proceſs.

Then you will have an admirable oriental *Emerald* green, which may be wrought as you pleaſe.

EMERIL } a ſort of metallick ſtone, found in moſt or all
EMERY } mines of metal; but principally in thoſe of iron, copper and gold.

There are of it three kinds; the *Spaniſh*, *red*, and *common Emery*.

The *Spaniſh* is found in the gold mines of *Peru*, and other provinces of *Spaniſh America*.

It is accounted a ſort of marcaſite of gold; being ſtreak'd with little veins and ſpecks of it.

But this ſort is very rare among us, the King of *Spain* prohibiting the exportation of it.

The *red Emery* is found in copper mines, what we have of it comes from *Sweden* and *Denmark*.

The *common Emery* is found in iron mines, and is what is moſtly us'd in *England*.

It is us'd by various artificers in poliſhing and burniſhing iron and ſteel works, marble, cutting and ſcalloping glaſs, &c.

This *Emery* is of a browniſh colour, bordering a little on the *red*, exceedingly hard, and of conſequence very difficult to be reduc'd to a powder.

The *Engliſh* are ſaid to be the only people who have got the art of pulverizing it, which is done chiefly by means of certain mills contriv'd for that purpoſe, and thus ſend it in powder to their neighbours.

It would be in vain to pound it in mortars, it being ſo hard that it would pierce or break the mortar, ere it would give way.

The ſtone ſhould be choſe of a high colour and as rough as poſſible.

EMPEDOCLES is painted in violet, murrey, or purple, and ſo are generally the reſt of the *Grecian* philoſophers.

EMPERORS of *Germany* are painted in a violet coloured robe, watchet or light coloured.

EMPERORS of *Rome* are painted with yellow carruſters embroidered with ſilver; the labels of their ſleeves and ſhort baſes, of watchet; their under ſleeves and long ſtockings white; a laurel wreath with a ſilver jewel before, and rays of gold iſſuing from the wreath.

ENAMEL, vulgarly call'd *Amel* is a kind of coloured glaſs, us'd in painting in *Enamel.*

The baſis of *Enamel* is the fineſt cryſtal glaſs, made of the beſt *kali* from *Alicant*, and ſand vitrified together.

To this glaſs are added tin and lead in equal quantities calcin'd by a reverberatory fire.

To this fundamental compoſition of *Enamel*, are added other metallick or mineral matters, to give it the various colours requir'd, as *crocus martis* for yellow, *æs uſtum* for green.

Enamel may be diſtinguiſh'd into three kinds.

The *firſt* intended for the counterfeiting and imitating precious ſtones.

The *ſecond* is for painting in *Enamel.*

The *third* is us'd by the *enamellers*, jewellers, and goldſmiths on gold, ſilver and other metals.

The *Enamel* us'd in imitating precious ſtones, and alſo that for painting, is uſually prepar'd by the workmen themſelves, who are employ'd in thoſe arts. The reſt comes to us either from *Venice* or *Holland*; and particularly the white is that by which the makers of the *Dutch* ware give the luſtre and poliſh to their works.

The compoſition is the ſame in the main in all the three kinds; the difference conſiſts only in giving it the colour and tranſparency.

ENAMELS *for painting.*

The *white Enamel* us'd by painters in *Enamel*, is the ſame with the common *Enamel* us'd by *enamellers*; except that it is to be prepar'd by grinding and cleanſing it with *aqua fortis.*

Then it is waſh'd in fair water, pounded or ground over again in a mortar made of flint or agate.

The *black* is made of *perigueux* well calcin'd, and ground with oil of *Aſpic*; having an equal quantity of the *enamellers*, or goldſmith's black added to it.

The *ruddy-brown* is made with *fæces* of vitriol and ſalt petre, or with the ruſt of iron, well ground on an agate with oil of *Aſpic.*

The *yellow Enamel* is the ſame with the goldſmith's *Enamel*, the compoſition of which you will ſee hereafter.

Vermilion red is made with vitriol calcin'd between two crucibles luted together; afterwards firſt waſh'd in *aqua fortis*, and then in fair water, the fire muſt be moderate for about half an hour.

Lake red is compos'd of fine gold diſſolv'd in *aqua regia*, with *ſal armoniac* or common ſalt; when the diſſolution has been compleated, it is to be put into a cucurbit with ſpring water and Mercury in a ſand heat for twenty four hours. Then the powder which remains at the bottom of the cucurbit, after the water has been pour'd off, is to be ground up with double its weight of flower of ſulphur, put into a crucible and ſet over a gentle fire. And after the ſulphur which takes fire is exhal'd, the red powder which remains is to be ground up with *rocaille.*

Blue is made of the *azure* or *lapis*, us'd by oil-painters well purified and prepar'd with brandy, and ſet for five or ſix days in a bottle expos'd to the ſun's rays.

An *amber colour* is made by white copperas calcin'd. Theſe ſeven or eight colours or *Enamels*, ſerve for compounding all the reſt; as *blue* and *yellow* make *green*, and ſo of other colours.

Jewellers, *Goldſmiths* and *Enamellers Enamels.*

Theſe are brought to us chiefly from *Venice* or *Holland* in little thin cakes of different ſizes; commonly about four inches diameter, having the mark of the maker ſtruck on it with a punchcon.

The marks which are the moſt uſual, are the ſun, a ſyren, a monkey, or the name of *Jeſus*, &c.

Thoſe which come from *Venice*, are chiefly white, carnation, yellow, ſlate colour, ſky-blue, green, and a deep blue call'd a falſe *lapis.*

Theſe ſeven colours are the principals of all the others; which ariſe out of the mixture of theſe, and the white in particular, is as it were the ground of all the other ſix principal colours.

The *white*, as has been ſaid, is made of cryſtal glaſs, and lead calcin'd by a reverberatory fire. This becomes a ſky blue by adding copper and *cyprus vitriol*, a green by adding filings of copper, *&c.* a yellow by adding the ruſt of iron; a fleſh colour by adding *perigueux*; and a ſlate colour by adding azures.

ENAMELLING is a method of painting with *Enamels* or metal colours, ground, reduc'd to powder, and us'd with a pencil like other colours; then fus'd, bak'd again, and vitrified by force of fire.

This art is very ancient, and ſeems to have been firſt practiſed on earthen or potter's ware

Hiſtory makes mention of beautiful vaſes, enamelled with various figures made as early as in the age of *Porſenna* King of *Tuſcany.*

It is true, theſe came far ſhort in beauty to thoſe afterward made at *Faenza*, and *Caſtle Durante* in the *Dutchy* of *Urbino*, in the time of *Raphael* and *Michael Angelo.*

Some of theſe vaſes are ſtill to be ſeen in the cabinets of the curious; the deſign or drawing of the figures of all which are much ſuperior to the colouring; they of thoſe times being unacquainted with the art of making any more than two colours, *viz.* black and white, either for earthen or metal works; excepting a faint kind of carnation in the faces and other fleſhy parts.

The art was retriev'd in *France* in the time of *Francis* I, and particularly at *Limoges*; where many valuable pieces were wrought, after the manner of the ancients, *i. e.* perform'd well as to the drawing, and *clair-obſcure*, chiefly in two colours.

There are two ways of *painting in Enamel*; the one with clear and tranſparent, and the other with thick and opake, colours.

To make the firſt fit for uſe, they are only to be ground up with water, and for the ſecond with oil of *Aſpic.*

The firſt are laid on the metal flat, and bordered or edg'd with a run of the metal, to keep the colours aſunder, though there are ſome pieces, the colours of which have been laid on contiguous, and without any partition; which is very difficult to do, by reaſon the tranſparent colours in melting are apt to run the one into the other; eſpecially in the little works.

The invention of opake colours is of a much later date, and by much preferable to that of tranſparent ones.

But all metals will not equally admit both kinds; as for inſtance, copper will not bear all the tranſparent colours, which bears all the opake ones; but in laying the tranſparent ones, they are forc'd firſt to cover it with a lay or couch of *black Enamel*, and upon that lay leaf of ſilver, and apply upon this other ſuitable colours, *i. e.* the colours and *Enamels* proper for ſilver, which itſelf does not allow of all kinds.

Thoſe which ſuit beſt with it are purple, green, azure, and aqua marine. But gold receives all kinds and colours perfectly well, both opake and tranſparent.

But then the gold us'd muſt be the very fineſt. For if the tranſparent colours are laid on a baſe gold, they will grow dim and livid; there being a kind of ſmoke that ſettles on it not unlike black-lead, Of tranſparent *Enamels* the hardeſt are the beſt; although there is a difference even among theſe, ſome retaining their colour in the fire, and others loſing it.

As for the *reds*, they are only red by accident; they being only yellow when made and apply'd on the gold, and becoming red in the furnace.

The beſt tranſparent reds, are thoſe made of calcin'd copper, iron ruſt, orpiment, and calcin'd gold, melted with the due proportion of glaſs.

But all our fine modern pieces of *Enamel* are owing to the method of painting with opake or thick *Enamel*; particularly thoſe curious ones on gold, repreſenting portraits to as great perfection, as the beſt painting in oil, and even ſome hiſtory pieces; with this great advantage, that their luſtre never decays.

The *French* claim the invention of this art; nothing of the kind having been attempted before the year 1630, when *Jean Toutin*, a goldſmith of *Chaſteaudun*, and a great maſter in the common way of painting in tranſparent *Enamel*, firſt apply'd himſelf to the finding out a way to uſe thick colours of different teints, which ſhould melt with fire; but yet retain their luſtre, purity, *&c.*

Toutin ſucceeding in his attempt, and having got the ſecret communicated it to his fellow *artiſts*, who alſo in their turns contributed to the bringing it to a higher perfection.

The firſt that diſtinguiſh'd himſelf was one *Dubie*, who wrought in the galleries of the *Louvre*; to him ſucceeded *Mortiere*, a native of *Orleans*, who apply'd himſelf chiefly to the painting of rings and watch caſes.

But *Robert Vauquer* of *Blois*, ſcholar to *Mortiere*, exceeded all that had been before him both in deſign and colours.

And *Pierre Chartier* of *Blois*, betook himſelf to the painting of flowers, wherein he ſucceeded to admiration.

By this time the *Engliſh* were fallen into the way, and were the firſt who apply'd it with ſucceſs to the painting of pourtraits, which was now grown mightily in vogue in the place of thoſe in miniature; M. *Felibien* obſerves, that the firſt and moſt finiſh'd pourtraits, and thoſe in the fineſt colours were brought into *France* by *Petitot* and *Bordier* from *England*; this put *Louis Hance* and *Louis Guernier*, two good painters in miniature, to attempt the like, in which the latter ſucceeded beyond every body.

He was alſo the inventor of ſeveral new teints for *carnations*, and had he liv'd much longer had probably merited the glory of carrying the art to its laſt perfection.

This kind of painting to be in perfection muſt be done on plates of gold; for ſilver turns the whites yellow and copper, beſides that it emits a fume, which tarniſhes the colours, is apt to ſcale and crackle.

Theſe plates muſt be made a little hollow on one ſide, and rais'd on the other, either in a circular or oval form, to prevent the gold's fretting by the fire, and making the colours crack and fly; nor muſt they be made too thick.

It is enough if they can bear the colours; though it is uſual to ſtrengthen them all around with a circle ſomething thicker. The plate having been hammer'd very evenly throughout, a white *Enamel* is laid on both ſides, although but one of them is to be painted. The deſign of this is to prevent any ſwelling and warping by the fire, for otherwiſe in large pieces, and eſpecially if the colours be laid on any thing unequally, they are apt to riſe up in puffs and bliſters.

Now this firſt lay which is white, remaining ſmooth and uniform, ſerves as a ground for all the other colours.

The gold plate being thus enamelled with white; the draught or deſign to be painted muſt be chalk'd hereon, and afterwards the whole accurately drawn out in a ruddy brown.

The draught or out-line being thus finiſh'd, the piece is ſet to the fire, and then painted with the colours.

The white ground painted on ſerves all the colours for white, it being the uſual method to ſpare the ground from firſt to laſt, in the places where the lights are to be, after the ſame manner as in miniature; though they have another white to lay over the other colours, when there is occaſion to raiſe them.

As painters in oil retouch their paintings ſeveral times, and let them dry, ſo in this ſort of painting they touch the piece as often as they pleaſe, ſetting it each time to a reverberatory fire, and taking it away again as ſoon as they perceive the *Enamel* has got its full poliſh.

The reverberatory fire is made in a little furnace, wherein there is fire both at top and all around; only a void place in the middle, where the piece is to be put for the *Enamels* to melt. See the plate.

The colours are laid on with the tip or point of the pencil, as in miniature; with this only difference, that they uſe oil of *Aſpic* to dilute them inſtead of gum water. See MINIATURE.

The method of ENAMELLING *by the* LAMP.

The lamp is made either of *copper* or *tin* and conſiſts of two parts, the box and the lamp.

In the lamp which is a kind of a flat oval, is put the oil (call'd *cabbaline oil*, i. e. horſes greaſe) and out of this riſes the wick.

All the uſe of the box is to receive the oil, which the ebullition occaſion'd by the intenſe heat, might throw abroad.

This lamp is plac'd on a table of a proper height, *&c.* under which about the middle of its height is a double bellows like the bellows of an organ, which the workman raiſes and falls with his foot, to increaſe and quicken the flame of the lamps, which is by ſuch means rais'd to a degree of vivacity almoſt incredible.

If there be ſeveral lamps plac'd upon the ſame table, the wind of the bellows is convey'd to the ſeveral lamps, though there be never ſo many by means of grooves cut along the thickneſs of the table, and cover'd with parchment, extending from the bellows to a tube or pipe plac'd before each lamp; theſe tubes are of glaſs, and that the *enamellers* may not be incommoded by the heat of the lamp, each tube is covered at about ſix inches diſtance, with a piece of tin call'd a *fan*, fix'd in a hole of the table.

In works which don't take up much time, they only uſe a glaſs blow-pipe, to heighten the flame of the lamp.

When the *enameller* goes to work, he heats himſelf before the lamp, with his foot on the treddle; and holding in his left hand the piece of work he has to *Enamel*, or the braſs and iron wires his figures are to be form'd with; with his right hand he draws out the thread from the *Enamel*, held to the lamp; and this with a ſurprizing dexterity.

So that by applying the cake of *Enamel* to the flame of the lamp, he draws it out into threads inconceivably fine.

Thoſe that are made uſe of in artificial plumes of feathers, are ſo very ſlender, that they may be wound on a reel like thread or ſilk.

The factitious jeats of divers colours, ſometimes us'd in embroideries are alſo made of *Enamel*, and that with ſo much art, that each piece has its hole to paſs the ſilk through, with which it is ſew'd. Theſe holes are made by blowing them in long pieces, which are afterwards cut off with a proper tool.

The *Dutch* or *Venetian Enamels* are ſeldom us'd pure; the common way is to melt them in an iron ladle with an equal quantity of glaſs or cryſtal.

And when the two matters are in perfect fuſion, they draw it out into threads of different ſizes, as occaſion requires, by taking a quantity between two pipe ſtopples, held in the two hands and removing them aſunder, as far as the arms will reach.

If the thread be longer than the workman can ſtretch, a ſecond perſon takes one of the ends, and draws it out while the other holds the *Enamel* to the flame.

All the threads drawn after this manner are round, ſo that if the nature of the work requires them to be flat, they are afterwards drawn through a pair of pinchers while yet hot.

They have alſo another ſort of inſtrument in manner of plyers, to draw out the *Enamel* by the lamp, when it is to be work'd or diſpos'd in figures or otherwiſe.

Laſtly, they have glaſs tubes of various ſizes, for blowing the *Enamel* into various figures, and preſerve the neceſſary vacancies therein, as alſo the ſpare ſtuff, and form the contours.

There is nothing but what may be thus repreſented by *Enamel*; and there are figures ſo finely finiſh'd of this kind, that one would take them to have come out of the hands of the ableſt ſculptor.

BLACK ENAMEL. *The mixture or matter for* Enamels *in general.* Take leaden bullets thirty pounds, tin in bits thirty three pound; mix them and calcine them, as is directed in the article CALCINATION (which ſee) ſearce the calx, put it into a glaz'd earthen pot full of water; ſet it over a fire, let it boil a little, take it off the fire, decant off the water gently into another veſſel, which carries along with it the fineſt flower of the *calx*, repeat this till no more flower will riſe; then calcine the remaining calx, as you did before.

Put theſe waters into one large body or veſſel, and evaporate to a dryneſs, over a very gentle fire.

The mixture for Enamels. Take of this calx twenty five pounds, of fritt of white *tarſo* ſearced twenty five pounds, fine ſalt of tartar four ounces; mix all well together in a pot, and let it ſtand in a glaſs-houſe fire furnace, for ten hours to meliorate and purify; then take it out and reduce it to an impalpable powder, which keep cloſe in a dry glaſs for uſe.

I. *Thus is the matter prepar'd to receive colours for* Enamel. Take of this mixture ſix pounds, *zaffer* prepar'd three ounces, *manganeſe* prepar'd three ounces, reduc'd to a very fine powder, put them into a glaz'd earthen pot in the furnace for ſome hours; let the pot be very large, becauſe the metal will ſwell much; when it is purified, caſt it into cold water, and dry it, put it into the pot again to melt and purify; then if the colour is good, keep it for uſe, if not you muſt put in more or leſs of the colouring matter, till it is perfect, and then make it into cakes.

II. *Another black* Enamel. Take of the above mention'd mixture ſix pounds, *zaffer* prepar'd, *crocus Martis* made with vinegar, *feretto*, of each two ounces, all being reduc'd into a fine powder; mix them well together, put them into a glaz'd earthen pot in a furnace to melt and purify; when it is well digeſted, caſt it into water; then dry it, and put it into the pot again; let it melt and refine, then take it out and make it up into cakes.

III. *Another velvet black* Enamel, *finer and fairer than the former.* Take of the ſaid mixture ſix pounds, red-tartar ſix pounds, manganeſe prepar'd three ounces, reduce all to a very fine powder; mix them and put them into a very large well glaz'd earthen pot, becauſe the maſs will ſwell; melt and purify, caſt it into water, dry it and put it into the pot again, melting and purifying as before; make it up into cakes, and keep it for uſe.

A black for painting on Enamel.

1. The former black *Enamel*, levigated with oil of ſpike, makes an excellent colour.

2. Take black *Enamel* of either ſort, peregrine well calcin'd of each four ounces, mix and make an impalpable powder; then add oil of ſpike, and it will agree excellently with the *Enamel.*

I. BLUE ENAMELS *or turcoiſe.* Take of the mixture for *Enamels* ſix pounds, *zaffer* prepar'd three ounces, copper twice calcin'd one ounce twelve grains, reduce all to a fine powder; put it into a white glaz'd earthen pot, when the metal is well melted, caſt it into water, dry it, and put it into the pot again, and let it ſtand till it is well melted, purified and incorporated; then take it off and make it up into cakes.

II. *Another noble blue.* Take of the mixture ſix pounds, plates of copper calcin'd three ounces, *zaffer* prepar'd one ounce twelve grains, theſe being reduc'd to a fine powder, mix and melt them as before, caſting it into water; dry it, and return it into the pot again to melt, purify and incorporate, then take it off and make it into cakes.

III. *Theſe glorious blues* are admir'd by moſt people, as being the moſt agreeable to the ſight of all others; their beauty and ſplendour being ſo great and tranſcendent above all other colours, they only having the reſemblance of heaven itſelf; for which reaſon the *Romaniſts* eſteem it a ſacred colour.

IV. *A blue turcoiſe* Enamel. Take of the mixture ſix pounds, put it into a white glaz'd earthen pot, melt and purify it, caſt it into the water, and dry it, put it into the pot again, melt it and add to it at times the following mixture.

Take ſcales of copper thrice calcin'd three ounces, *zaffer* prepar'd four ſcruples and ſix grains, *manganeſe* prepar'd eighteen grains, all reduc'd to a fine powder; mix them and ſtir the maſs very well each time with your iron hook, that the powders may incorporate; being well coloured, take it out and make it into cakes.

But you muſt obſerve, that the colour is right good and perfect, before you empty your pot; for experience muſt teach you how to proportion the tinging ingredients, as to more or leſs; if there be too much of the tinging matter add more of the mixture, if too faint, add more of the tincture or tinging matter or powder, till the colour is as you would have it.

As this colour is very fine, ſo it is very difficult to make well, and requires many trials and much experience; therefore you muſt not be diſcourag'd, if you fail in your firſt eſſays; for by continuing to make farther trials, you will at length effect what you deſire; and be able to judge and know, when you are in the right, and when in the wrong.

A blue for painting on Enamel. Take any of the foregoing *Enamels*, purify them with *aqua fortis*, and grind them with oil of ſpike as for other colours; theſe are ſome of the nobleſt that can be us'd for this work.

2. Take painter's *Enamel* prepar'd, put it into a glaſs bottle, add to it *aqua vitæ*, ſo as to cover it four inches, four times a day, ſo will the groſſer parts fall to the bottom; decant the clear liquor, evaporate the ſpirit, and dry your *azure*, and it will be very fine; then grind it on a marble, and it will be fit for this work, and far beyond *ultramarine*; which yet may be made uſe of as occaſion requires.

Proper rules and matter for all ſorts of Enamel, *with directions for qualifying the fire, in order to ſucceed well.*

This moſt agreeable way of enriching gold by *Enamel*, which proceeds from the beautiful variety of colours which may be apply'd, being an art no leſs painful than neceſſary for ornament, we proceed to lay down ſuch methods in this book, as ſhall equally anſwer the benefits of the publick, and ſatisfaction of the more curious.

We propoſe in the firſt place, to give direction for the choice of matter to be us'd, and thence ſhew the preparations for all ſorts, and how to make and ſuit the colours moſt convenient on *Enamel*.

The method not only uſed by the goldſmiths, but by ſuch as form portraitures with it of all ſorts, as *men*, *beaſts*, *fowl*, and other curioſities, very naturally, by a juſt diſpoſure of the colours, is moſt admirable; to effect which no more is requir'd than a lighted taper, and a hollow pipe of metal for that purpoſe, to blow the blaze to the *matter*, and make it malleable and ſoft, and thence the ſeveral figures are drawn or impreſs'd thereon.

And this may be ſo far improv'd and heightned, as to admit of performances rather to be thought the eſſay of a divine than human artiſt. Witneſs that notable *piece* of a *chariot* drawn by *two oxen*, of which *Cardan* takes notice in the fifty ſecond chapter of his *tenth book*, which was ſo compleatly done in *miniature*, that the whole might be cover'd with the wing of a fly. The *ſhip* rigg'd, and man arm'd, which *Howel* ſays he ſaw. Thoſe little ſtatues of *men*, with ſeveral other curioſities of figure *Vornicus* alſo aſſures us of. Not to omit the church of St. *Mark* at *Venice*, where the *Moſaick-work* is plentifully interlaced with hiſtory of all ſorts, diſtinguiſhable by the variety of colours, and gildings, and all conſiſting of ſeveral different ſubjects. In ſhort, what account *Agricola* has left us of theſe matters, in his twelfth book, give us no leſs cauſe to admire this art than he had, when he ſaw ſuch notable pieces of which he makes mention, and which he aſſures us was deſervedly very great. The uſe of *Enamel* is very ancient, however that of working on metal is more modern; and for the great perfection to which it is arriv'd, we are oblig'd to this preſent age.

To prepare the matter for Enamel. Take lead in piggs thirty pounds, *plate-tin* of *Cornwal* thirty three pounds; mix and calcine them as directed for lead, preciſely obſerving the directions there laid down. This done ſearce the *calx*, and put it all into a glaz'd earthen pot, fill'd with water, put it over a fire, and let it boil a little; then take it off, and pour the water gently into another veſſel, which will carry along with it the more *ſubtile calx*. Repeat this until no more of the *calx* can be ſubtiliz'd; which you may diſcover by the pureneſs of the water in pouring it out of one veſſel into the other. After this calcine the remains of what is in the firſt pot, as before, and thus continue to calcine and ſubtilize till you can get no more of the *ſubtile calx*. Laſtly, put the waters out of all the receivers into larger, and ſet it on a ſlow fire to evaporate. The fire muſt be very gentle for this reaſon, that the *calx* do not founder or fall to the bottom, but continue more fine and ſubtile, than when it was firſt calcin'd.

Your *calx* being thus prepar'd, take thereof about twenty five pound, and as much *fritt* of white *tarſo* beaten and ſearced, to theſe add four ounces of ſalt of *tartar*, finely ſearced and prepar'd; mix all theſe powders very well together in a pot, and let it ſtand in the glaſs-houſe furnace or oven about ten hours to digeſt and purify; then take them out, and reducing them to an impalpable powder, keep it in a cloſe dry place for uſe. Thus muſt your matter for *Enamel* be prepar'd to receive the colours, but of that more hereafter.

To make Enamel *of a milk-white colour.*

This colour of all others is the pureſt; 'tis uſed for the ornaments of virginity, the emblem of innocence, as alſo the ſymbol of candour and chaſtity. To perform this, do thus: take ſix pound of the prepar'd powder, and twenty four grains of *manganeſe* of *Piedmont*, prepar'd; mix them well together, and put them into one of your furnace pots to melt and purify over a very ſwift fire, which will be done in a little time. The matter being thus melted, take it out of the pot, and throw it into very fair water, and being afterwards dryed, put it again into the pot to melt; do thus with it thrice, changing the water. When you have thus purified it, if you find it juſtly white, 'tis good; but if it be greeniſh, add a little more *mangane∫e*, and 'twill become white as milk, and fit *Enamel* for gold, or other metal. Take it off the fire, and make it up into cakes, and keep them for uſe.

A turcoiſe-blue Enamel.

This colour of the *turcoiſe* or *Turkey-ſtone*, is very fine for *Enamel*, but withal very difficult to make well, and requires a great deal of experience. But now for the *Enamel*, which to make of this *turcoiſe* colour, you muſt put of the *prepar'd powder* ſix pound, into a white glaz'd pot to melt and purify it; then caſt it into water, and when dry put it again into the pot, and being melted over again, add to it, at four times, this compoſition, *viz. ſcales* of copper thrice calcin'd, three ounces, of prepar'd *zaffer* eighty ſix grains, of *manganeſe* prepar'd, forty eight grains; mix all theſe and reduce them to a very fine powder, ſtir the matter very well each time with your iron-hook, that the powders may incorporate, and for reaſons given elſewhere.

Thus when your matter is fully and well tinged, take the approbation of a goldſmith on ſome of it, as to the colour, that you may have the more aſſurance before you proceed to empty your pot. Your own experience muſt ſhew you how to proportion the ingredients for tinging the matter more or leſs. If you perceive that the tinging-powders are too predominant, add the more principal prepar'd powder, if it be too faint, add the greater quantity of the tinging-powders; and thus do to improve or leſſen the colour until it be to your ſatisfaction.

To make a very fine blue Enamel.

You may make *Enamel* of this colour with four pound of the *principal* prepar'd *powder*, two ounces of prepar'd *zaffer*, forty eight grains of copper thrice calcin'd, theſe reduc'd to a mixt impalpable powder, muſt be put into a white glaz'd pot; when the metal is well melted, caſt it into water, and when 'tis dry put it into the pot again; after that, let it ſtand upon the fire until it be well digeſted and incorporated; then take it off, and you have a very fine *Enamel* for goldſmiths, which make into cakes, and keep for your uſe.

Another blue Enamel.

This *Enamel* is altogether as gay as the former, only the colour is not the ſame, for which reaſon 'tis preſcrib'd here.

To make which, take four pounds of the principal prepar'd powder, two ounces of plates of copper calcin'd, forty eight grains of prepar'd *zaffer*, mix and reduce them to an impalpable powder, put this into your white glaz'd pot, and having melted the metals until they incorporate, caſt it into water, whence being dry, return it to your pot, and let it remain there until it purify;

when the colour is well mixt to your ſatisfaction, take it off, and cake it as before.

To make a pretty green Enamel.

It may be very perfectly imitated, if you put four pounds of the *principal powder* into your white glaz'd pot, and let it melt and purify ten or twelve hours in the furnace, afterwards caſt it into water, dry it and put it into the pot again, and let it be fully refin'd; then take ſcales of copper thrice calcin'd two ounces, ſcales of iron at the ſmith's forge on the anvil-block, forty eight grains; mix and reduce them to an impalpable powder, and throw it at three ſeveral times and portions into your pot of principal matter, ſtirring the metal very well, that it may be equally tinged by the mixture of the colours; if it be to your fancy, and of a pleaſant colour, let it ſtand a while on the fire, until it be throughly incorporated; thus take it off, and you'll have a delicate green *Enamel* very proper for all ſorts of goldſmith's work.

Another green Enamel.

The colour of this following is ſomething different from the former, but no leſs excellent: Take ſix pounds of principal powder, two ounces of *feretto* of *Spain* prepar'd, forty eight grains of *crocus Martis*, prepar'd with vinegar, make theſe into an impalpable powder, and mix them well, and put theſe into your white glaz'd pot; let it remain in the furnace to melt and refine the matter; afterwards caſt it into water, and again into your pot, having refin'd it before, until it refine very well; when 'tis melted, obſerve whether the colour be ſatisfactory, and let it ſtand ſome hours longer to refine, and when 'tis taken off, you'll have a very fine green *Enamel* for goldſmiths.

If the colour be too faint, add more tinging powder proportionably enough to perfect it.

Another.

There is another way to make green *Enamel* after this manner; put into a white glaz'd earthen pot four pounds of *principal powder*, and let it refine in the furnace a little while, caſt the metal afterwards into water, and (being dry'd) again into the pot; then add at three equal portions, this powder compounded of ſcales of copper thrice calcin'd, two ounces, and of *crocus Martis* prepar'd with vinegar, forty eight grains, theſe well mixt and powder'd together, ſtirring the metal with the iron-hook to incorporate it, let it remain on the fire until it be well refin'd, and when 'tis well and perfectly colour'd to ſatisfaction, take it off and keep it for uſe.

To make black Enamel.

'Tis moſt neceſſary in this art, and can leaſt of all be ſpar'd, becauſe it has a peculiar beauty which ſets it off among the more ſplendid and ſparkling pieces; you may make a very good velvet-colour with four pound of the *principal powder*, two ounces of prepar'd *zaffer*, and two ounces of *manganeſe* of *Piedmont*, prepar'd as before directed; mix and pulverize them very well together, and put them into a glaz'd earthen pot in the furnace for ſome hours; the pot muſt be more than ordinary large, becauſe the metal will riſe very much; when 'tis purified, caſt it into water, dry it, and then return it into the pot to be refined over again, which will be in a little time; then ſee if the colour be to your fancy, and according as you find it, put in more or leſs of the former ingredients, and having thus perfected it, take it off and cake it; this *Enamel* will be a good velvet-black for goldſmiths.

Another black Enamel.

This ſecond ſort is diſtinct from the other by the difference of the quantities and tinging ingredients.

Take ſix pounds of *principal powder*, two ounces of *zaffer* prepar'd, two ounces of *crocus Martis*, prepar'd with vinegar, two ounces of *feretto* of *Spain*, pound and mix them very well together, making an impalpable powder, and put it into your glaz'd pot in the furnace to melt and purify; when it is well digeſted, caſt it into water, and dry it, and put it again into the pot, where let it remain a while to refine; when 'tis for your purpoſe, take it off and cake it as uſual; and you'll have a very good and moſt convenient *Enamel* for the goldſmiths to ſet in colours, and enamel with.

Another black Enamel.

Here is a third way of making the velvet-black *Enamel*, much better and of a finer gloſs than the former.

To make which, take four pounds of *principal powder*, four ounces of *red-tartar*, two ounces of *manganeſe* of *Piedmont* prepar'd, reduce theſe to a very fine powder, and put into a glaz'd pot bigger than ordinary, becauſe of the riſing of metal; let it melt and digeſt in the furnace, and caſt it into water, (and when 'tis dry, put it into the pot again, there to remain until it melt and refine anew; when you find the colour proper for your uſe, make it into cakes, and keep it for the goldſmiths uſe.

To make purple-colour'd Enamel.

Take four pounds of *principal powder*, add to this two ounces of *manganeſe* of *Piedmont*, prepar'd as for red *Enamel*, put theſe into a white glaz'd earthen pot, allowing it room enough to bear with the ebullitions and riſing of the metal; when 'tis thoroughly melted, caſt it into water, dry it, and put it again into the pot to refine; then conſider whether it be well enough colour'd, and accordingly make it up into cakes, and keep it for uſe as before.

Another purple Enamel.

This is no leſs delicate than the former, for all manner of goldſmiths work.

Take ſix pounds of the *principal powder*, three ounces of *mangane*ſ*e* of *Piedmont* prepar'd, ſix ounces of ſcales of copper thrice calcin'd, as before preſcrib'd, reduce theſe to an impalpable powder, and let them diſſolve and refine in the white glaz'd pot in your furnace; afterwards caſt the metal into water, dry it well, and return it into the pot to refine over again; examine the colour, if it be right, take it off and cake it up for uſe as before.

To make Enamel *of violet-colour.*

Take ſix pounds of *principal powder*, two ounces of *mangane*ſ*e* of *Piedmont* prepar'd, and forty-eight grains of thrice calcin'd ſcales of copper, make all into a very fine powder, and being well mixt, put them together into your white glaz'd earthen pot in the furnace, let it melt and digeſt; then caſt it into water, and dry it, put it into the pot again, and let it refine very well; try its colour, and if 'tis agreeable, take it out and cake it, and you'll have a very fine violet-colour'd Enamel, proper for all manner of goldſmiths work of that ſort.

To make yellow Enamel.

Take ſix pounds of *principal powder*, three ounces of *tartar*, ſeventy two grains of prepar'd *mangane*ſ*e*, reduce all into an impalpable powder, mix it well, and put it into a glaz'd earthen pot, large enough to diſpenſe with the ebullition and riſing up of the metal; let it ſtand in your glaſs-houſe furnace to melt and incorporate, afterwards caſt it into water, then dry it, and leave it in the pot again to refine very well; then try the colour, and if it be ſufficient, make it into cakes as before, and you'll have a very taking yellow *Enamel* for all ſorts of metal except gold, which by its reſemblance would only dull and ſpoil the beauty, unleſs it were placed among other colours, as the goldſmiths already are very well acquainted withal.

*To make a cry*ſ*tal-ground for red* Enamel.

The red requires a *cry*ſ*tal* more laſting than any of the former, therefore the following is a compoſition fit for that purpoſe.

Take twenty four pounds of ſalt of *polverine*, *rochetta*, or ſ*oda*, prepar'd, and ſix pounds of fritt, theſe mixt and finely powder'd, muſt be ſteep'd in water to bring the maſs into a body like paſte, and then make it up into ſmall thin cakes; lay them on tiles in a lime-kiln, or potter's-furnace for ſix hours to calcine, or near the glaſs-houſe furnace vault, or on the upper vault, taking ſpecial care that they don't melt, let them remain there for three or four days, or until they be very well calcin'd.

This done reſolve them into and impalpable powder, adding thereto four pounds of calx of lead and tin prepar'd and calcin'd according to directions, four pounds of white calcin'd *tartar*; theſe being mixt and very finely pulverized, put them into your glaz'd pot at the glaſs-houſe furnace to melt and refine, thence throw the metal into water, and again (when dry) into the pot to melt; caſt it a ſecond time into the water, and dry it, let it melt and refine over again in the pot for ſome hours, and 'twill be fit for uſe.

Conſider always the lead which is among the other ingredients, and be very careful that you let none of it remain in the pot when you throw the matter out into the water, for it will be apt to precipitate to the bottom, and this for ſeveral reaſons elſewhere given.

An excellent preparation of fuſible mangane ſe to be uſed in making red Enamel.

We have given ſufficient direction elſewhere, to prepare *manganeſe* of *Piedmont*, for tinging theſe matters, of which we have already diſcours'd, but for red and roſe colour *Enamel*, there are ſome more exquiſite ingredients and preparations required, which we ſhall give an account of here before we ſpeak of the *Enamel* itſelf.

Any other than *manganeſe* of *Piedmont* will not ſerve the purpoſe, for that only is fit for the uſe to contribute to the fairneſs and life of the colour; take therefore equal quantities of this *manganeſe* and *ſalt-petre*, as much as you pleaſe, and let them reverberate and calcine in an earthen pot in your furnace twenty four hours; then take it out and waſh it well in warm water to ſeparate the *ſalt-petre*, dry it well, and the maſs will be of a red colour: To this add an equal quantity of *ſal-armoniac*, grind theſe on a marble with diſtill'd vinegar, as painters do their colours; dry it, and reduce it to powder, putting it afterwards into a ſtrong matraſs or bolt-head of glaſs, big-belly'd and long-neck'd, there to ſublimate about twelve hours; break your matraſs, mix all the volatile and fixed parts together, adding the ſame quantity of *ſal-armoniac*, as there are flowers, and take care to weigh them before compoſition; grind, pulverize, and ſublime as before, repeating this until your *manganeſe* remain fuſible in the bottom of the matraſs; and this is that which you muſt preſerve to tinge cryſtal with, and make it ruddy and diaphanous, or tranſparent as a ruby.

The way to make a fixt ſulphur, to be uſed in compoſitions for Enamel.

This fixt ſulphur ſerves for ſeveral uſes in chymiſtry, and very convenient for obliging young artiſts.

Now, though it be not ſo unavoidably neceſſary for making *red Enamel*, yet we will not omit it here, becauſe it contributes to our preſcribing two ſorts of ways for it, as well as to ſatisfy the more curious goldſmiths.

Put flowers of ſulphur, as much as you pleaſe, into a glaſs cucurbit luted at bottom, pouring thereto oyl-olive as much as will drown the matter by two inches; ſet the cucurbit on a violent ſand-furnace for a full hour; then take it off, and pour in ſtrong vinegar, and the ſulphur will ſoon precipitate, and the oil aſcend on the ſurface of the vinegar; decant this from the ſulphur into another veſſel, and put in more freſh oil as before, do thus thrice, and you'll have at length a fixt ſulphur to make uſe of for *Enamel.*

Another fixt incombuſtible ſulphur.

There is yet another way for fixation of ſulphur for the ſame uſe, and ſeveral chymical operations, wherein it has very great virtue.

Make ſtrong lye of quick lime and harſh oak aſhes; put therein flowers of ſulphur until the liquid ſurface be four inches upmoſt; boil it for a conſiderable while over the fire; this will cleanſe and purge the ſulphur from its unctuoſity and corruption, and qualify it for your purpoſe. Separate the lye from the ſulpur, and drying it, you'll have it white, fixt, and incombuſtible, exceeding proper for the goldſmiths to make uſe of on gold.

To extract ſpirit of Saturn, an excellent ingredient for Enamel and glaſs-work.

We think fit to propoſe all the preparations proper for making a red *Enamel*, before we ſhew the way to make it, becauſe the ingredients to be uſed muſt firſt be provided, in order to proceed regularly to our buſineſs.

Reduce good litharge, as much as you pleaſe, to an impalpable powder, and ſet it in a glaz'd earthen veſſel over a ſtill fire; add to this good diſtill'd vinegar, till four inches above it; mix them well together, and then let them ſettle until the vinegar become milk-colour'd, which will be in a little time; decant this vinegar off gently, and put on freſh, continuing to do thus until it admits of no more colouring; then put all the milk-colour'd vinegar into a glaz'd earthen veſſel, and let it ſtand until the lead precipitate to the bottom; from whence pour off the clear vinegar, which will be at top; and that milk-colour'd ſediment which remains, is what we call ſpirit of *Saturn*, tho' improperly, and that which we make uſe of for the *Enamel* and glaſs.

If it do not precipitate well to your liking, and that the vinegar at the top be not clear, caſt ſome cold water among it; if that won't do, and that your vinegar continues muddy, ſet all the water and vinegar together over a gentle fire to evaporate, and thus you'll have the more ſpirituous part of your vinegar a ſediment in the bottom of the veſſel, which is exceeding uſeful for glaſs-work. Keep it together with the reſt of the *Saturn* for uſe.

This noble preparation, which we call ſpirit of *Saturn*, does indeed contain it, but you muſt have skill to extract it thereout. To ſay that 'tis all ſpirit of *Saturn* is untrue, for 'tis that wherein the ſpirit is contain'd, and from whence it may be more eaſily and better ſeparated, than from the maſs of lead; I propoſe this firſt ſtep towards extracting it as ſuch, whereby the curious may ſucceed with little trouble.

To make Enamel of a blood-colour red.

To ſtain *Enamel* of this colour, take ten pounds of common fritt, add to it ſix pounds of glaſs of *Saturn* prepar'd, make all into a very fine powder, which muſt be put into a glaz'd earthen pot at the glaſs-houſe furnace, to melt, boil, and refine; after this, caſt thereon powder of thrice calcin'd copper at diſcretion, ſtirring all about that they may incorporate together with powder of red *tartar* until it be perfectly ſtained; and thus you'll have a delicate deep ſanguine *Enamel* fit for all manner of work you can deſire to apply it to.

Another blood-colour Enamel.

This *Enamel* will be very beautiful, and may ſerve inſtead of the roſe-colour *Enamel* hereafter preſcribed.

To make which, put ten pounds of fritt for cryſtal, and ſix pound of glaſs of *Saturn* before-mentioned into one of the glaſs-houſe furnace pots; let it melt and purge well; after this caſt it into water, dry it, and return it into the pot; when 'tis well melted again, throw in at ſeveral times, five or ſix ounces of powder of thrice calcin'd copper, ſtirring all together with the iron crook to mix and incorporate them well together, and alſo a like quantity of powder of red *tartar*, ſtill ſtirring it; this being well boil'd and refined, obſerve if the colour be perfect, if not, add equal parts of the powders of *copper* and *tartar*, as much as you find neceſſary to bring it to perfection. Let it remain to boil and purify, trying it again and again, until you find it completely colour'd.

Another red Enamel of a very ſplendid ruby-colour.

The beauty of this *Enamel* is very ſurprizing, and of as lively a luſtre as the ruby it ſelf, which it communicates to all the work wherein 'tis uſed.

For this fine effect, we muſt have recourſe to the fuſible *manganeſe*, of which add twenty ounces to each pound of cryſtal ground: let the whole be well purified; then try the colour, and according as you find it, add the greater or leſſer quantity of *mangane*ſ*e*, or cryſtal ground reſpectively, until it be brought to its juſt degree of perfection, as a ruby, and which ought to be very admirable.

Another ballas ruby colour Enamel.

The ſame *mangane*ſ*e* muſt be had to make this fine colour; put ten pound of cryſtal ground in a glaz'd pot, to melt and purge at the glaſs-houſe furnace; throw the matter into water, dry it, and melt it over again; do thus thrice, and when the maſs is afterwards well melted, tinge it with the fuſible *mangane*ſ*e* as before, and 'twill become purple-colour'd. Add to it at eight times impalpable powder of alum to bring it to a red. Be very careful that the alum do not blacken it; but rather make it yellowiſh, and the *mangane*ſ*e* diſſipating, 'twill become red, and ſo make the colour moſt perfect and juſt, of a fine ballas ruby.

*Another Enamel of a ro*ſ*e-colour for gold.*

Take ten pound of cryſtal ground, melt it at the glaſs-houſe furnace in a glaz'd pot; add to it at four times five ounces of red calcin'd copper, ſtirring the metal every time; then put into it *crocus Martis*, and *mangane*ſ*e* prepar'd as before; then let it alone to cleanſe for ſix hours, and if the colour is not true, put in by little and little more *crocus Martis* until it be of a fine roſe-colour.

*Another very fine ro*ſ*e-colour.*

Among our roſe colour *Enamels*, this ſeems the fineſt; to make which, take four pounds of *cry*ſ*tal* ground, let it melt in a glaz'd pot at the glaſs-houſe furnace; caſt it afterwards into water, and melting it over again, add by little and little an ounce and a half of *calx* prepar'd, ſtirring the metal every time to incorporate; then let it alone for a little while, until you perceive it of an aſh colour; when it comes to that, forbear putting in any more *calx*, leſt you make it too white; then refine the maſs, and after add to it minium two ounces, purge, refine, and throw it out into water, and putting it into the pot, let it ſtand to melt, and purify over again about eight hours; then put in an ounce and half of red thrice calcin'd copper, and as much crude white *tartar*, with a dram of blood-ſtone, and the like quantity of fixt ſulphur; theſe pulveriz'd very fine and mixt together; ſtir the metal, and incorporate them very well together: afterwards ſee if the colour anſwers your expectation; if it be too deep, add a little more *mangane*ſ*e* to weaken it; if it be too pale, improve it with ſome more of the laſt compoſition of *copper tartar*, blood-ſtone, and ſulphur, until it be to your purpoſe. And thus you have an *Enamel* of an exceeding fair roſe-colour.

Another roſe-colour Enamel.

Set ſix pounds of cryſtal ground in a glaz'd pot at the glaſs-houſe furnace to melt and cleanſe; then caſt into it at four ſeveral times intermitting, four ounces of calx as prepar'd of lead and tin; ſtir the matter very well at each time until it incorporate; then let all purge for a while, and caſt it ladleful by ladleful into water, and again put all into the pot to melt and refine anew; after this, add to it an ounce and a half of red copper pulveriz'd and calcin'd, which will tinge the whole of a deep colour, but caſt it in at three intervals, and ſtir it very well to incorporate. Two hours after, add to it at thrice, an ounce and a half of *crocus Martis*; mix it well as before, and let it remain to refine about three hours; then throw on it ſix ounces of *tartar* calcin'd, chimney ſoot vitrified one ounce, *crocus Martis* again one ounce and a half pulveriz'd, and all well mixt at four ſeveral intermiſſions and quantities, ſtirring the metal always with the iron-crook; let it ſwell, but not boil over. After this, let it repoſe and purify about three hours; ſtir it again and try the colour; if it be red as blood, it's right; if not, add at diſcretion, a little more of each of theſe powders of *tartar*, ſoot, and *crocus Martis*, until the colour be full and true, and ſo let it ſtand for a whole hour, and try it again; if you find it perfect, proceed no further, but keep it for uſe, 'tis very proper to apply to gold for *Enamel.*

Another ſplendid Enamel of a carbuncle colour.

Take very pure gold, and for the better aſſurance, refine it your ſelf, and diſſolve an ounce of it in three ounces of *aqua regalis*; let the ſolution diſtil over a gentle fire until the gold precipitates, and thus repeat an exhalation and cohobation ſix times, and the laſt time take out the gold; powder and put it into a crucible cover'd and luted, on a reverberatory to calcine; let it remain until it become of a very excellent and ſcarlet red, which will not be without a conſiderable allowance of many hours.

This done, take of the cryſtal ground, and melt a quantity of it in a glaz'd pot at the furnace of the glaſs-houſe; and being well purg'd, throw in a twentieth part of the powder of gold, in proportion to the quantity of the metal, ſtirring the whole very well; let it alone for ſome time; then try it, and according as you find the colour, put in more powder, until you bring it to a true tranſparent carbuncle-colour.

We have given another way to calcine gold, no leſs ſufficient than this, together with a way to make a fine carbuncle; and this rare colour may as well be given to the ſtone as the Enamel, by the directions for preparing the gold; the curious may chooſe which they will, they being equally ſufficient.

The way to calcine copper for making vitriol of Venus, without corroſive.

The calcining of copper is the firſt preparation to be made in making the *vitriol* of *Venus* without corroſive, which is known to very few, and whereof we have already given an eulogy.

Take thin leaves of red copper, and put them into crucibles, ſtratifying them layer upon layer with powder of common ſulphur, filling your crucibles until all the copper leaves be put in; then cover well, and lute the crucibles; let the lute dry; and put them into the furnace, continuing a good charcoal fire for two hours; afterwards let them ſtand and cool; then take off the crucibles, and you'll find your copper calcin'd and blackiſh, inclining to a deep purple powder; ſearce it, and to each pound add ſix ounces of powder of ſulphur; mix, and put them into a round flat-bottom earthen pot, ſtrong enough to bear the fire; lay upon the furnace a ſtrong earthen diſh, fill it with very live coals, and place your pot thereon with the copper; when the pot grows hot, and the ſulphur takes fire; ſtir it with your long iron crook, leſt it ſhould ſtick to the pot, or become concrete; continue thus till the ſulphur be all conſum'd and ſmoaks no more; take the pot hot off the fire, and empty the copper out with an iron ladle; pound it well in a braſs mortar, and ſearce it all finely, and you have a blackiſh powder; reiterate this calcination thrice, with the like proportion of ſulphur as before, and the third time let it remain until the copper become red and yellow; then take it off and pound it in a braſs mortar, and ſearce it finely, pounding what remains over again, until all be ſearc'd, and you'll have a very well colour'd *calx* of copper, moſt effectual and proper for extracting this fair *vitriol* of copper, whereof the following is the preparation.

To make vitriol of Venus without corroſive.

Thoſe who make *vitriol* of *Venus* have not all one and the ſame method, moſt of them diſſolve the copper in diſtill'd vinegar, ſpirit of *nitre*, or ſome other corroſive; for our part, water alone is the diſſolvent, or rather agent to extract the tincture, as we ſhall ſhew.

Take glaſs cucurbits as many as will ſerve your purpoſe, to contain all your calx of copper, and put ſix pound of fair running water to a pound of *calx*, into each cucurbit; place them on a moderate ſand furnace for four hours, to evaporate until one third of the water goes off; let the furnace cool, and afterwards decant the remainder of the water into other glaſs-veſſels, and dry the ſediment in a crucible on the furnace. Let this water ſettle for two days, and then you'll find in the bottom of the veſſel ſmall grains of copper of a blackiſh colour; you muſt filtrate or ſtrain the water, and preſerve all the grains together, to add to the former ſediment, having firſt well dried them, and keep the water.

Take all theſe ſediments, and to each pound add ſix ounces of ſulphur powder'd as before, putting it into your flat-bottom'd earthen pot to calcine; take care to ſtir it well as long as the ſulphur fumes, and it ſtands over the fire, elſe it will ſtick to the pot, and not calcine; take it off and powder it immediately in a braſs mortar; ſearce the powder, and you'll find it black; mix this again with ſulphur proportionably, ſix ounces to a pound, and put it to calcine anew, ſtirring it very well as before directed; let it ſtand a while on the fire to alter the matter from a ruſſet to a yellow; then take it off and pound it inſtantly in a braſs mortar before it cool, and then ſearce it all finely over.

Put a pound of this powder with ſix pound of water into each cucurbit, and theſe cucurbits on a ſlow ſand-furnace, where let it ſtand four hours to the conſumption of one third of your water, which decant into other veſſels; let it ſettle two days; then filtrate theſe waters, and pour them among the former, gathering the ſediments that remain in the bottom, and mix them with theſe in the cucurbits.

Dry the remaining ſediments as before, and repeat the calcination anew with the ſame proportionable quantity of ſulphur; then extract the tincture, filtrate and mix the filtrated and tinged waters with the former, exactly obſerving the order already taught, and continue to do thus ſix times, ſo will the copper remaining in the bottom of your veſſels become as it were a ſoft impure earth depriv'd of all its blueneſs, which throw away as fit for nothing; for all the virtue of the copper is contained in the waters; put theſe all carefully together to extract from them this precious *vitriol of Venus*, as hereafter directed.

The way to extract a fair vitriol of Venus from our coloured waters.

Of all the preparations to be taught for this rare work, this is the moſt eaſy and common, there being no more required, than to evaporate and cryſtallize the matter; but as we are to leave nothing in the dark, we reſolve to explain every circumſtance thereof for the benefit of our readers, and ſuch as would know it.

We have ſaid you muſt mix all your colour'd waters, now we will tell what muſt be done with them; you muſt have a low glaſs-cucurbit that will hold two quarts or more, which put into a moderate aſh or ſand-furnace; put therein three pound of the tincture to evaporate gently, and put the reſt into glaſs-bottles ſet round your furnace, ſo that they may be heated, and ready to fill the cucurbit as faſt as the exhalation conſumes its tincture, which may be done with a glaſs ladle, or the bottles themſelves, leſt the waters being cold might cauſe the cucurbit to burſt, and ſo all would be loſt.

Reduce ten pound of this by evaporation to two and a half, or three at moſt, which will be a very high tincture, pour it into two or three glazed earthen veſſels, and place them all night in a moiſt cold place, and you'll find the vitriol at bottom, and ſticking to the ſides of the veſſels, like little long icicles, which will have the true colour of oriental *Emeralds*; pour all the remaining waters into the cucurbit, and dry the *vitriol* that it may not ſtick, preſerving it in a cloſe veſſel.

Place your cucurbit again on the furnace to evaporate anew to the conſumption of half the waters, and cryſtallize the ſtrong tincture as before. Thus whilſt any water remains, evaporate and cryſtallize until all be conſumed, to the end that none of this may be loſt, whoſe vertues are infinitely uſeful, not only in the *art of glaſs* and the *metallick*, but in *phyſick* too, for the curing of many diſtempers, which we will paſs over as foreign to our ſubject, and go on in preſcribing the reſt of this rare work, and conceal nothing from the curious, but give them entire ſatisfaction.

The method of drawing the ſpirit of the vitriol *of* Venus, *which has a wonderful blue, and how to ſeparate the* caput mortuum *for tinging of glaſs.*

Put a pound of this *vitriol* into a glaſs retort ſtrongly luted, the lute being dry, ſet the retort in a ſand-furnace, fitting to it a very large receiver, as directed for *aqua fortis*; this done, kindle the fire, and continue it gentle for four hours to prevent a too exceſſive heat, which would drive out the ſpirits impetuouſly, and ſo burſt the receiver, whereof great care muſt be taken not to ſpoil all. As ſoon as the ſpirits aſcend like white clouds, improve your fire by degrees, until they diſperſe and your receiver clears again and cools, and all the ſpirit comes together: then let the fire go out of it ſelf, and after twenty-four hours, unlute the joints, take away your receiver, and put the liquor it contains into glaſs-bottles, and ſtop it very cloſe with glaſs-ſtopples to prevent air, which if they could draw, would diſperſe it all by exhalation. This choice liquor has that noble blue which affords us wonderful tinctures, and other ineſtimable operations, as well as ſuch ſurprizing effects in phyſick, as cannot be equalled.

But to return to our *caput mortuum* of this precious *vitriol*, which has occaſion'd us to give its preparation, and is what we make uſe of for this fine water-colour, or *egmarine* on glaſs, you'll find it in the retort, out of which the white ſpirit was diſtill'd, whereof we have already treated. To get it, you muſt

break

break the retort; then reduce it to powder with a mixture of *zaffer*, and ſo tinge your cryſtal of an admirable ſea-green colour.

We were miſtaken in ſaying before, that the *caput mortuum* muſt be expos'd to the air before you pound it with the *zaffer*, for that is not altogether incumbent in tinging of glaſs, tho' this expoſing of it cannot but add ſomething to the luſtre, for it draws thereby with a certain magnetick property, the occult ſpirit of the air, and ſo from a black, of which it was before, becomes of a pale blue colour, and partly aſſumes what is loſt by diſtillation and extraction of the ſpirits, ſo you may ſave a great deal of time and pains by this preparation, to your no ſmall advantage in expediting the matter.

The way to Enamel in all ſorts of colours on gold and other metals.

The ancient works of *Enamel* on metals, were only of black and white, with ſome few tinges of carnation, or fleſh-colour, as may be ſeen in the *Limoge Enamel.* In *Francis* the Iſt's time it became more improv'd, and they made uſe of *lights* and *ſhadows*; but the *Enamel* on gold was of no better ſtuff than that on copper, and all the works of it on gold, ſilver, and copper, were of tranſparent matter; ſuch as wrought it on thick, couched each colour by itſelf, as is done now a-days in enamelling ſome particular pieces of *relief*, and not otherwiſe.

Since they have found out the way of enamelling with opake and thick ſtuff, and the art of compounding the colours is much more improving and handſomer than that of the ancients, as is viſible in all our modern works; we muſt without all exception, own the fair works upon gold, repreſenting portraitures and entire hiſtories, ſo neatly, and to the life, and coveted as much as picture done in oil, over which it has the advantage of natural luſtre and varniſh, which is never tarniſhed, to be the invention of this latter age, and the improvements therein we owe to the *French*.

All ſorts of *Enamel* are not to be promiſcuouſly employed on all ſorts of metal. Gold which perfectly bears with, as well all the opake as tranſparent, cannot agree with clear purple, its yellow mightily changes the colour thereof, and produces but a very ill fancy. On the contrary, this purple is very fine on ſilver; ſo the egmarine, the azure, and green, all other colours, as well clear as opake, diſagreeing therewith; and copper ſuits with every thick *Enamel*, but cannot endure the limpid, unleſs prepar'd for it beforehand, as ſhall be ſhewn in due place.

Obſerve, that good *Enamel* muſt be hard and laſting, ſuch as is ſoft being full of lead, and ſubject to change colour, eaſily becoming ſullied and foul. Of the clear *Enamel*, ſome is harder, ſome ſofter; the hardeſt is always the beſt, however, even of them there is choice; ſome loſe colour in the fire, ſome are more or leſs lively and ſparkling; but if you employ conſtantly ſuch as we have before preſcribed, you'll never meet with thoſe inconveniences; for the ingredients being perfectly cleanſed, will endure all degrees of fire, any change of colour or quality not enſuing.

Of the furnace for enameling and portraying.

The enameling of metals, as well as the colouring of the ſtuff, cannot be effected without fire, and is wholly different in this point from painting with the uſual colours in oil, which may be dried in the air only, without other help.

It would be very hard to believe the fire would not ſpoil the mixture of the colours, if our daily experience which we made, did not vouch the contrary; however care muſt be taken not to let the work have too much time, but draw it out as ſoon as you find it poliſhed.

The fire muſt be reverberatory, or rather of ſuppreſſion, and never to be under the ſtuff; 'tis the ſame as is uſed for cleanſing of metals, whether in mints or goldſmiths ſhops, which is very familiar to all the world.

You muſt have the furnace round or ſquare, either of iron or earth, it's no great matter, how (or whether of theſe) it is, which muſt be hollow in the middle, to contain the work with a good charcoal fire all about, and over it, to make it melt the better; and you muſt have it ſo as to be able to take your ſtuff out, and put it in again, as occaſion requires. You may, for better conveniency, make uſe of a goldſmith's muffle; 'tis a ſmall arch, made of crucible earth, in the ſhape of half a crucible, cut lengthwiſe, and they place it on the area or floor of the furnace, the opening of it lying juſt againſt the mouth of the furnace, to put in and draw out the work eaſily; and for more conveniency, they place a ſmall grate over it, which muſt not touch it, for fear of breaking it; and on this grate make a good fire, and ſo round about the muffle, to heat the hollow very well, under which they put the work to be enamel'd and painted; and the eſſays or trials they have a mind to make on a little iron-ſhovel, to draw the eaſier out; but for making eſſays of ingredients for *Enamel*, it muſt be a little blade of white *Enamel*, which ought to be provided purpoſely for that uſe.

The way to Enamel gold.

We have already ſaid, that gold, ſilver, and red copper may be enamel'd; now to make true work, you muſt uſe only pure gold, becauſe ſilver makes white *Enamel* appear yellow, and copper riſes in ſcales, and makes vapours; for though all *Enamel* ſticks to it, yet it is but very imperfectly, and may be eaſily divided

Plate. XIII.

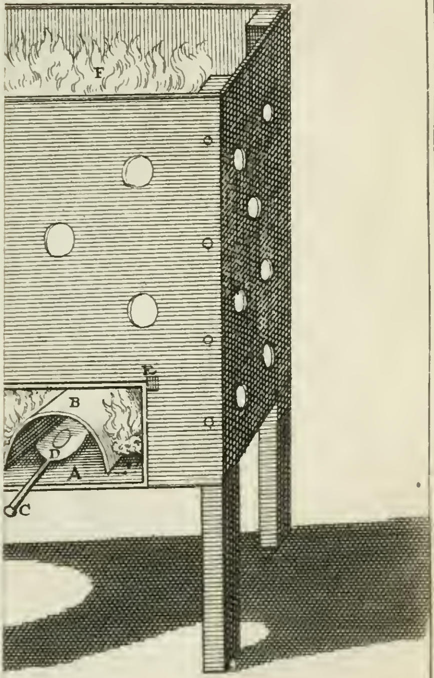
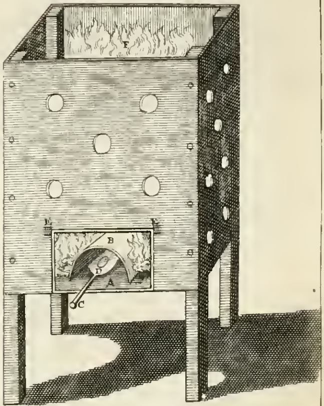


Plate. XIII



A *The mouth of the Furnace*
B *The Cover*
C *An iron Peel*
D *The Enamel to be melted*
E. *The Grates*
F. *The inner part of the Furnace*

vided and peel'd off again; beſides, the colours are ſo wretched on it, that they loſe much of their charm and luſtre by the impurity of that metal.

Therefore, if you would have good work, let gold only be your ſubject, and of the pureſt, if you employ clear *Enamel*, becauſe on impure gold they grow dull, and become imperfect, that is to ſay, there appears with this a certain obſcure and cloudy vapour in the *Enamel*, which deadens and takes way the life of its colour.

The gold plate ought to be riſing, and when it is forged very even, the goldſmiths apply white *Enamel* over and under it, tho' it is to be wrought but on one ſide; but this is neceſſary for two reaſons; firſt, becauſe the work is neater and fairer for it; and again, becauſe if it were only enamel'd on one ſide, the fire would ſwell it, and ſo make it riſe, and that in bubbles; becauſe it is always as it were tormented, eſpecially when the pieces are great, and the *Enamel* careleſly laid on; this makes it produce bliſterings, which disfigure the work. The *French* chymiſts call ſuch *vegeter*, but their goldſmiths *petits ouillets*. This disfiguring of the work, you may avoid, by laying *Enamel* on both ſides of the plate of gold, and thicker over than under. This will keep it equal and even on both ſides, the firſt lay of white *Enamel* remaining ſmooth in this condition, ſerves for a field to place all your other colours on as we will farther diſcourſe of in the art of portraying.

Oil of *ſpike* is uſed for diſſolving thick and opake *Enamel* before it can be applied; for the tranſparent you need uſe nothing but fair water, as we ſhall ſhew anon; and then 'tis couched flat and border'd with the metal, and ſometimes we don't border at all, the field being *Enamel*; but this is troubleſome, becauſe the limpid *Enamels* as they melt, often mix, and ſo confound the colours, which conſtantly happens when the pieces are ſmall.

Red *Enamels* are not ſo, unleſs by chance, and come generally yellowiſh out of the fire; as ſoon as 'tis applied to the gold, it alters the colour; one may ſoon bring it to a perfect red *Enamel*, by turning it at the mouth of your furnace, when you are taking it out from the fire; and then it is that the workmen ſay they make it red, and give it its compleat colour.

Gold, as we have already ſaid, admits of all ſorts of *Enamel*, clear or opake, bright purple excepted, which is altered by the yellow-colour of the gold, and does not take ſo good effect there, as on ſilver, on which it ought ſtill to be uſed. The way of working every ſort of *Enamel* is alike.

To Enamel on ſilver.

We have already taken notice that ſilver agrees not with all ſorts of *Enamel*, as gold. We repeat it here again to prevent the uſe of any but ſuch as ſerve to produce perfect and agreeable effects.

You are to make leaſt uſe of white *Enamel* on ſilver, becauſe there it becomes yellowiſh, and unpleaſing; but nothing can ſuit better with it, than bright purple, green, blue, and egmarine, becauſe the whiteneſs of the ſilver is then clearly eminent, and gives its juſt ſplendor.

The work and manner of enamelling on ſilver, is no way different from that of gold, in forging the plates evenly to prepare them for the *Enamel*; you may make uſe of white on the under ſide, ſince the *Enamel* there ſerves only to qualify the riſings and diſturbings of the metal in the furnace, which would cauſe unevenneſs, or diſagreements in the ſurface, and prevent its becoming juſt and handſome.

We need not repeat again that way of placing the *Enamel* on your plates of gold or ſilver, and ſo to put them into your little reverberatory furnace (ſpoken of before) to melt, and as ſoon as poliſhed to be taken from the fire.

To Enamel on copper.

Though we have before touched upon the way of enameling on copper, yet leſt the reader ſhould too ſlightly apprehend it, we ſhall therefore treat of it here to avoid imperfection.

The leſs uſe is made of this metal in this work the better, for the *Enamel* never ſticks to it perfectly, but is eaſily ſcaled, divided, and broken off, which never happens to gold; beſides, the copper is ſo impure, that its fumes deſtroy the beauty of the *Enamel* ſo much in the furnace, that they quite loſe their charm and ſplendor by the malignity of thoſe vapours.

Though the copper receives eaſily all thick or dark *Enamels*, it can't be brought ſo well to endure the clear and limpid; now if you would make uſe of theſe laſt, you muſt firſt lay a lay of green, or black, and thereon a leaf of ſilver to receive the *Enamel* ſuitable for that metal mentioned before; ſo that in the main 'tis much better to make uſe of ſilver for the tranſparent *Enamels*, ſince the copper is ſo apt to foul, and the change in either the ſame.

In enameling on copper, you muſt take a plate of red copper forged ſmooth and even, applying your *Enamel* of what colour you deſire above and under the plate as before; then put this into the reverberatory furnace, and when it receives its poliſhing, draw it out.

To prepare the Enamel for the metals.

Before you apply your *Enamel* on the metal, you muſt give it this little preparation, which is the eaſieſt, and beſt approved of by the goldſmith. We will inſtance it in white *Enamel*, becauſe that is more generally made uſe of than any other.

Take white *Enamel*, pulverize it very fine, pour on it a little *aqua fortis*, and let it afterwards purify and refine in a ſmall glaſs cucurbit.

Waſh it afterwards often in fair water, dry and keep it in a cloſe veſſel for uſe.

To make uſe of it, firſt pound a quantity thereof in a ſtone mortar, wetting it with a little water, and ſo ſpread it on the plates, and into the furnace with it as before.

Thus do with all your clear and tranſparent *Enamels*, and you'll have all your things in a readineſs to go on with your work as you think convenient.

To prepare the colours for painting on Enamel.

Nothing can be more ſplendid than the paint on *Enamel*, and for this uſe muſt be choſen the livelieſt and moſt noble colours; and ſuch as will eaſily vitrify and melt.

All theſe before aſſigned, are as equally ſufficient for this, as for enamelling; if you grind them firſt on your marble with the beſt oil of *ſpike*, or mix them together with the other ingredients for that purpoſe, as we ſhall give a fuller account hereafter, and of all the matters to be uſed with calcined *Enamels*, which ſerve to make up the paint for *Enamel*, mixing them well together, as painters do on their pallets. When you want ſome colours of *Enamel*, you may with blue and yellow make a good fair green; a blue and red mixt, will produce a fine violet; a red and white creates a roſe-colour; a black and white forms a gallant grey, and ſo of others.

Every workman has his own ſecret, and peculiar way of working; but moſt of them make uſe of *rocaille* for varniſhing their colours, which has an ill effect, becauſe of too much lead, which is not perfectly purged off. This leſſens the life and ſplendor, and it always continues as it were tarniſhed, cloudy and dull.

But our *Enamel* being well refined, will produce work ſo fine and agreeable, that 'tis not poſſible to find any thing ſo illuſtrious and accompliſh'd; and ſuch as for their own private diverſion would work herein, and have not the conveniency of a glaſs-houſe, may be eaſily furniſhed, by proceeding to make one according to directions given. See the plate in the article FURNACE.

Notwithſtanding the ſufficiency of our *Enamel* for affording all ſorts of colours and tinges in painting on *Enamel*, we will yet preſcribe other means for this, no way inferior thereto, to anſwer the advantage and curioſity of thoſe who work at this excellent art.

To make white for painting on Enamel.

The beſt workmen, for the moſt part, uſe the white *Enamel* ground, which they can manage with addreſs enough to heighten and illuſtrate their *lights*, which is neceſſary to be done to all their colours, as in miniature. But as it is difficult to preſerve the ground juſtly for improving thoſe other colours, and ordering the compoſitions (all one as in carnation) you muſt take of our cryſtal ground, prepared with tin and lead purg'd and refin'd as before-mentioned, or rather of our milk-colour *Enamel*, which is the faireſt can be made; cleanſe it with *aqua fortis*; waſh, dry, and grind it afterwards with oil of ſpike.

Or you may prepare another white ground without lead, thus: take very pure tin calcin'd, and let it vitrify in a glaſshouſe pot, with eight times as much cryſtal fritt, as we have directed the preparation before-mentioned. Pulverize theſe very fine, and proceed preciſely, according to preſcription for purification, &c.

To make a black for painting on Enamel.

Though the black *Enamels* preſcribed before, and thoſe ſucceeding it, may ſerve to paint on *Enamel* with this colour, without any other preparation than grinding it with oil of *ſpike*; yet we will add here another black no leſs excellent and fine, ariſing from equal parts of black *Enamel*, and *peregrine* well calcin'd; mix, and reduce them to an impalpable powder, and then apply oil of *ſpike*, and you'll have a colour which will take with great facility on the *Enamels*.

A yellow for paint on Enamel.

We will only make uſe of our *Enamel*, prepar'd as before, mixt and purified with *aqua fortis*, and after waſh'd in clean water, as before-mentioned; dry and grind this powder with oil of *ſpike* on your marble, and 'tis fit for uſe. With this yellow and blue, as we have already hinted, may be made a fair green; but thoſe *Enamels* deſcribed before are ſo juſt and fine, that 'tis needleſs to uſe any other for that purpoſe. This preparation for the yellow here laid down is ſufficient alſo for it, without any farther trouble.

A blue to paint on Enamel.

The *Enamels* of this colour aſſign'd before, are the nobleſt can be uſed in this work; purify them with *aqua fortis*, and grind them with oil of *ſpike*, as before directed for the other colours.

You may, becauſe it is vitrified, make another blue fine enough, thus. Take painters *Enamel* prepar'd; add to this (put into a glaſs-bottle) beſt rectified *aqua vitæ*, enough to drown the ſtuff by four inches; ſtop it well, and ſet it in the ſun-ſhine five or ſix days, ſhaking the bottle well three or four times a day, that the purer *Enamel* may diſſolve, and the groſſer fall to the bottom. Take the *Enamel* out of your bottle, and ſteep the *fæces*, letting them precipitate as uſeleſs; then evaporate your *aqua vitæ*, and dry your *azure*, which will be a very fine well cleanſed matter for all ſorts of this work; grind it after on your marble. This *Enamel* ſo prepar'd, is moſt proper for painting, and far beyond the *ultramarine*, ſo much uſed.

A red paint for Enamel.

There can nothing exceed the perfection of our *Enamels* of this colour, taught in eight ſeveral articles before-mentioned; the like may be ſaid of our *blood-colour*, *rubies*, *roſe*, and *carbuncle*, which is the moſt exalted ingredient for *enameling* metal, or making paint on *Enamel*; and thoſe who practiſe this fine art, uſe no other than that of the glaſs-houſe, or ſuch as they make accordingly. Now this red *Enamel* is prepar'd as the other colours with *aqua fortis* to purify it, waſh'd, dry'd, and ground with oil of *ſpike* for your uſe.

There is yet another tolerable red, which they paint with on *Enamel*, in which is employ'd calcin'd gold; but this would be much more improv'd, if inſtead of their *rocaille*, they made uſe of our matter made of cryſtal and *Saturnus glorificatus*, or of our principal prepar'd powder before preſcrib'd, for theſe are exceedingly well purified, whereas the *rocaille* has too great a ſurcharge of lead, the impurity whereof always renders the work defective.

One takes an ounce of fine gold in very thin plates, theſe diſſolv'd in eight ounces of *aqua fortis*, and regulated with *ſal armoniac*, or old ſtrong ſalt, in a ſmall glaſs matraſs; this is put into a glaſs-cucurbit, wherein was already pour'd eight *Paris* pints of ſpring water, and ſix ounces of *Mercury*; the cucurbit is plac'd on a ſtill fire, and after twenty-four hours, the gold deſcends to the bottom in a light land-red powder; then the water is pour'd off leiſurely into an earthen glazed receiver, or pan, and the powder gather'd and dry'd by a moderate heat, and with a *ſhamois* skin they ſeparate the *mercury* from the gold, and grind this powder with twice its weight of flowers of *ſulphur* together; and then put all into a crucible over a ſmall fire, where the ſulphur will communicate it ſelf with the reſt, and then evaporating, they find the powder ſomewhat ruddy, which ground with *rocaille*, is what they make uſe of on the *Enamel*.

We own this calcination to be tolerable as to the gold; but as for mixing the *calx* with the *rocaille*, without melting them together to incorporate, is diſputable. We believe that in grinding them together with oil of *ſpike*, they may in ſome ſort incorporate as other colours, but can never ſo perfectly unite; beſides, the cryſtal matter does not ſo well receive the colour of the gold this way, as if it were done by fuſion.

Others make red inclining to vermilion, which they uſe in painting after this manner. Take vitriol calcin'd in two crucibles well luted together, and ſet for an hour over a ſlow fire; then purge it with *aqua fortis*, waſh it in fair water, and grind it with oil of *ſpike* as before, and ſo make uſe of it for *Enamel.*

All red *Enamel* which is good, ought to be hard, and not eaſily conſumed in the fire; for that which is otherwiſe, contains much lead, and ſoon becomes dull and ſullied, and is not of ſo laſting a ſubſtance, which the workmen ought to be cautious of.

To finiſh the preparation of *Enamel*, and before the manner of painting them is preſcrib'd, obſerve, that all the colours beforementioned, which are not pure *Enamel*, ought to be incorporated with a cryſtalline matter, ſuch as we have preſcrib'd, to the end they may vitrify the better, which elſe they'll not eaſily do, though moſt workmen make uſe of their *rocaille*, whether to avoid the trouble of making (or that they are ignorant how to prepare) a better matter; and this has obliged us to give ſeveral ways very good and true for this purpoſe to make fine and perfect work by.

The way to paint on Enamel.

This art is revered by all nations, 'tis ſo fine and ſo excellent, that the firſt and nobleſt perſons in the world practiſe it, as we have ſaid elſewhere. It is certain that the art of painting on *Enamel* is modern, but no leſs eſtimable for that, ſince its effects are ſo wonderfully beautiful, ſo infinitely laſting, of ſo natural a gloſs, and their ſplendor never to be defaced.

If it were poſſible to make large works of *Enamel*, as is done in picture, they would be ineſtimable becauſe of their luſtre, and ſo far ſurpaſs what antiquity has had ſuch great reſpect for, and which theſe latter ages ſtill careſs with extraordinary eſteem.

This way of painting on *Enamel* ſeems much more difficult than limning; practice however convinces us, that they are equally eaſy, and we can with as little trouble repreſent hiſtory on *Enamel*, as in limning; the difference lies only in preparing the colours, which is not done the ſame way; for we dry and varniſh our *Enamel* paint by fire, whereas that in limning is done by the air.

To paint on *Enamel*, you muſt have a plate of gold enamel'd with white, on which delineate and portray your deſign. This done, draw it over again in dark red; the piece being perfectly done off, and the lines complete to the ſubject, ſet the tablet, or piece in the muffle, on a reverberatory fire, to ſettle as before directed.

Your tablet being taken out, apply the colours in a juſt order as in limning, with this difference only, that here you make your white ground ſerve for filling, where that colour is required to ſet off the heightnings and luſtre of the *lights*, as is done in miniature; and becauſe it mightily contributes to the heightening thereof in the other colours as to improving their *lights*, according to the directions before-mention'd.

When the piece is thus finiſh'd, put it again into the furnace to fix the colours, and as ſoon as you perceive it varniſh or poliſh, draw it out, leſt the colours mix and ſpoil each other.

You may take out the work again, and reviſe it as often as you pleaſe, only putting it ſtill into the furnace, until it receives its juſt gloſs, &c.

This way of renewing and reviſing the tables, is done in limning with oil; and the painters obſerve, that the pieces muſt not be handled until they are well dry'd in the air, ſo thoſe in *Enamel* muſt be let alone until they receive their perfection from the fire.

This is all to be obſerv'd in painting on *Enamel*; it remains only for us to ſhew how to prepare your dark red for tracing the deſign; you may have it thus.

Take the *caput mortuum* which remains in the retort, after the *aqua fortis* is made of your *vitriol* and *nitre*, grind it with oil of *ſpike*, and ſo you have the dark red ready for your uſe; or you may make it with *crocus Martis*, ground with oil of ſpike.

THE END. The ſcope whereunto all operations are directed is repreſented in painting, by an old decrepit man with a grey beard, adorn'd with a garland of ivy; ſitting with a ſun departing from the eaſt, and ſeems to be in the weſt by its rays; holds a pyramid with 10 MS on it, and a ſquare with the letter *Omega*.

Decrepit becauſe he has one foot in the grave, the ivy denotes his want of ſupport, the *Omega* declares the end, as *Alpha* does the beginning; the 10 MS ſignify 10000.

ENGRAVING, } is the art or act of cutting metals and pre-
GRAVING, } cious ſtones, and repreſenting letters, figures, &c. on them, *Engraving* is an art which teaches the way of transferring any deſign upon copper, braſs or wood, by means of ſharp pointed inſtruments.

Engraving is properly a branch of ſculpture, and is divided into ſeveral branches according to the matters it is practis'd upon, and the manner of performing it.

The original way of *Engraving* on wood is now diſtinguiſh'd by the name of *cutting in wood*; that on ſtones for tombs, &c. *carving* or *ſtone-cutting*; that perform'd on metals with *aqua fortis* is call'd etching; and that perform'd with the graver on medals, as copper, braſs, ſteel, ſilver, &c. as alſo on precious ſtones, cryſtal, &c. alone keep their primitive name of *Engraving*, and that perform'd by the knife, burniſher, punch and ſcraper is call'd *metzo tinto*.

The art of *Engraving* is for the greateſt part of modern invention, not being older than the ſixteenth century.

It is true indeed, the ancients did practiſe *Engraving* on precious ſtones and cryſtals; ſome of which works are ſtill to be ſeen, equal to any production of the latter ages; but the art of *Engraving* on plates of metal or blocks of wood in order to form prints from them, was not known till after the invention of painting in oil.

The diſcovery of this art is aſcrib'd to *Maſo Finiguerra* a goldſmith of *Florence*, who being accuſtomed to take impreſſions of every thing he cut in clay, and to caſt melted ſulphur into this mould, at length found out the way of taking the impreſſions of them on paper, by ſmearing the figures of ſulphur with oil and lamp-black.

The ſecret was not long e'er it got abroad, and coming to the hands of *Albert Durer* and *Lucas*, they greatly improv'd it, and began to engrave on wood and copper, and ſucceeded to admiration.

ENGRAVING *in copper* is employ'd in repreſenting divers ſubjects, as portraits, hiſtories, landſkips, foliages, figures, buildings, *&c.* either after paintings or deſigns made for the purpoſe. This is perform'd either with the *graver* or *aqua fortis*; as for the *graver*, you muſt procure a copper plate, according to the ſize of the thing you would engrave on it; this plate muſt be well poliſh'd; then having your deſign drawn or trac'd over in looſe, *i. e.* ungummed ink, warm the plate over the fire and ſmear it lightly over with a thin ſkin of virgins wax, and on this lay the draught or deſign, done with ungumm'd ink, or red chalk, or black lead, *&c.* and rub it hard down that the wax may lay hold of it and take it off.

Having thus transferr'd the deſign upon the wax, it is to be trac'd through the wax upon the copper with a point or needle; then you muſt heat the plate over the fire, and wipe off all the wax, and the ſtrokes drawn on it with the needle, *&c.* will remain; which are to be followed, heightened, *&c.* according to the tenor of the deſign with the *graver*, which ought to be well tempered, and very ſharp.

All the art conſiſts in the conducting or guiding the *graver*, which depends not ſo much upon rules as practice, the habitude, diſpoſition and genius of the artiſt.

The inſtruments neceſſary for this performance, are a round cuſhion or ſand bag, made of leather to lay the plate on, to give it the neceſſary turns and motions, a *burniſher*, made of iron or ſteel, round at one end, and uſually flattiſh at the other, to rub out ſlips and failures, ſoften the ſtrokes, *&c.* a *ſcraper* to pare off the ſurface on occaſion, and a rubber of black hat or cloth, roll'd up to fill up the ſtrokes, that they may appear the more viſibly in order to know how the work proceeds.

ENGRAVING with *aqua fortis* is call'd ETCHING, which ſee.

1. The chief inſtruments us'd in *Graving*, are four; 1. Gravers. 2. An oil-ſtone. 3. A cuſhion. 4. A burniſher.

2. Gravers or graving tools are of three ſorts, round-pointed, ſquare-pointed and lozenge.

The round are the beſt for ſcratching withal, the ſquare-pointed ones are for cutting the largeſt ſtrokes; and the lozenge-pointed ones, for the moſt fine and delicate ſtrokes; but a graver of a middle form between the ſquare and lozenge-pointed, will make the ſtrokes or hatches appear with more life and vigour, according as it is manag'd in working.

3. The *oil-ſtone* is for whetting the gravers upon, this ought to be very ſmooth, but not too hard, and without pin-holes.

This is us'd as follows; *having put a few drops of clean olive oil upon the ſtone, lay that ſide of the graver that you deſign ſhall cut the copper, flat upon the ſtone, whet it very flat and even, and for that purpoſe you muſt take care to carry your hand ſtedfaſt with an equal ſtrength, placing the fore-finger firmly upon the oppoſite ſide of the graver.*

Then turn the next ſide of the graver, and whet that in the like manner, that you may have a very ſharp edge for an inch or more.

Then turn that edge that you have whetted uppermoſt, and ſetting the end of the graver obliquely upon the ſtone, whet it very flat and ſloping in the form of a lozenge (with an exact and even hand) making a ſharp-point to the edge of it.

If the graver be not very good, and very exactly and carefully whetted, it will be impoſſible to perform the Graving *with niceneſs and curioſity.*

5. The *Graving cuſhion* is a roundiſh, but flattiſh leather bag filled with ſand to lay the plate upon, on which it may be turn'd eaſily any way at pleaſure.

The plate muſt be turn'd with the left hand, according as the ſtrokes which you are engraving turn; this is to be attained by practice and diligent care.

5. The *burniſher* which is an iron tool is us'd in rubbing out ſcratches, ſpecks or other things, which may cauſe faults in your work on the plate; and alſo if any ſtrokes ſhall happen to be cut too deep or groſs, to make them appear leſs and fainter by rubbing them with it.

Of the making of Gravers.

1. *You muſt be provided with ſome croſs-bow ſteel, and procure it to be beaten out into ſmall rods, and ſoftened, and this being done,*

you may with a good file ſhape them as you pleaſe ; this being done, beat them red hot, and immediately dip them into ſoap, which will render them very hard.

2. In doing this obſerve, that in dipping them into the ſoap, if you turn your hand never ſo little awry, the *Graver* will be crooked.

3. *If the* Graver *prove too hard, lay the end of it upon a red-hot charcoal, till it begins to grow yellowiſh, and afterwards dip it in tallow (or as ſome ſay in water) and it will toughen it.*

4. Then having ſharpened the *Graver*, ſtrike the point of it into a piece of hard box wood, to take off all the roughneſs about the points, which was caus'd by whetting it upon the oil-ſtone.

5. In the laſt place, touch the edge of the *Graver* with a file; if the file cuts it, it is too ſoft, and will not work; but if it will not touch it, it is fit for the work.

If the Graver *breaks on the point, it is a ſign that it is tempered too hard; but will oftentimes, after a little uſe by whetting come to be well conditioned.*

Of POLISHING *the* COPPER *plate.*

1. Take a copper plate about the ſize of your work, that is to be *Engraven* on it, and that is free from fire flaws.

2. Hammer it very even and ſmooth on a ſmooth anvil; then take a pumice ſtone, free from gravel (leſt it ſcratch it, and thereby cauſe a great deal of labour to get out the ſcratches) with a little water.

3. Then drop a few drops of olive oil upon the plate, and burniſh it with your burniſhing iron, and afterwards rub it well with the end of a piece of charcoal (made of beech-wood and quench'd in urine) dipt in water.

4. With a roller made with black felt, caſtor or bever hat dipt in olive oil, rub it well for an hour or more, and your plate will be ſufficiently poliſh'd.

Of the manner of holding the Graver.

1. It will be proper to cut off that part of the knob of the handle of the *Graver*, which is upon the ſame line with the edge of the *Graver*; by this means, making the lower ſide that is held next to the plate flat, that it may not be any interruption in the *Graving*. See the plate.

2. For *if you work upon a large plate, if that part of the handle of the* Graver *be not cut away, it will ſo reſt upon the copper, that it will interrupt the ſmooth and even motion of your hand in making the ſtrokes; and will cauſe the* Graver *to run into the copper deeper than it ought to do.*

3. Place the knob at the end of the handle of your *Graver* in the hollow of your hand, and having extended your fore-finger

Plate. XIV.

7. 2.

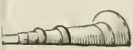


Fig. 1.

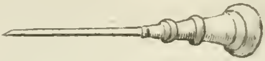
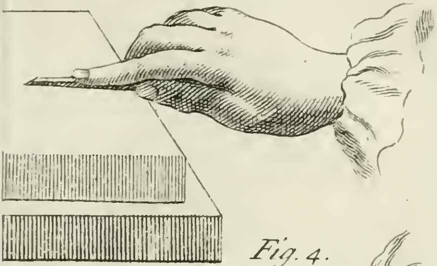


Fig. 3.



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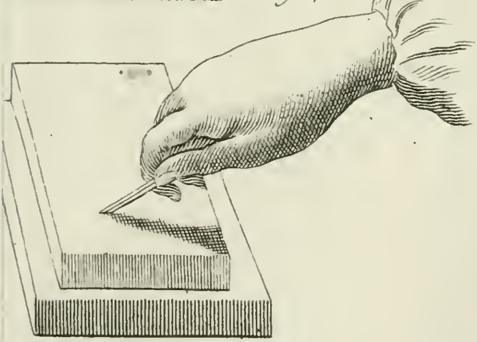

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Fig. 6.

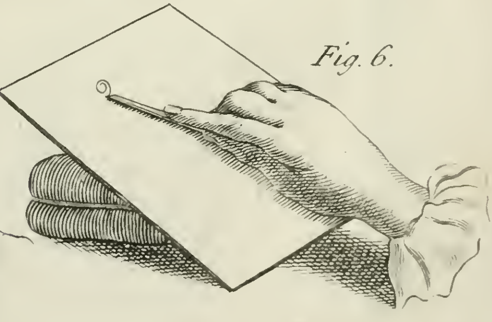


Plate. XIV.

Fig 2.

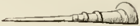


Fig. 1.

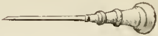


Fig 3

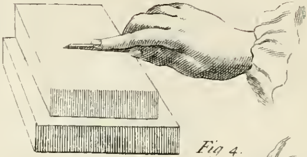


Fig 4.

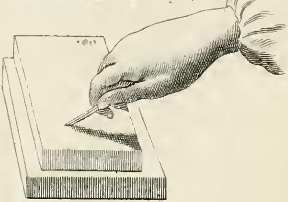


Fig. 5.

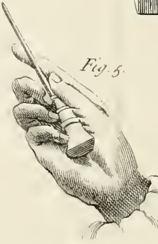
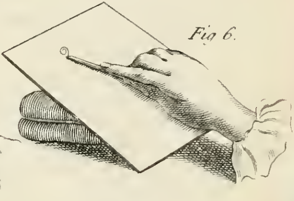


Fig 6.



finger towards the point of the *Graver*, laying it at the top or oppoſite to the edge, which is to cut the plate; place your thumb on the one ſide the *Graver*, and your other fingers on the other ſide, ſo as that you may guide the *Graver* flat and parallel with the plate.

4. Take care that your fingers interpoſe not between the plate and the *Graver*, for they will be an hindrance in carrying your *Graver* level with the plate, and make the lines more deep, groſs and rugged than you would have them.

Of the way and manner of ENGRAVING.

1. Having (as has been ſaid before) a cuſhion filled with ſand about nine or ten inches diameter, and three or four inches thick, and a plate well poliſh'd, lay the plate upon the cuſhion, being plac'd on a firm bench or table. See the plate.

2. Holding the *Graver*, as before directed, in making ſtrait ſtrokes, take care to hold the plate firm upon the cuſhion, move your hand, leaning lightly, where the ſtroke ſhould be fine, and heavier where the ſtroke ſhould be broader.

3. In making crooked or circular ſtrokes, hold the hand and *Graver* ſtedfaſt, your arm and elbow reſting upon the table, and move the plate againſt the *Graver*; for otherwiſe it is impoſſible to make thoſe crooked or winding ſtrokes with that command and neatneſs that you ſhould do.

4. Take care to carry your hand with ſuch a ſlight, that the ſtroke may end as finely as it began, and if there be occaſion to thicken and make one part deeper or blacker than another, it ſhould be done by degrees; and that you may do it with the greater exactneſs, obſerve, that your ſtrokes be neither too cloſe nor too wide.

For your more exact obſervation, you ſhould practiſe by ſuch prints as are more looſely ſhadowed, leſt by imitating the more dark, you ſhould not know where to begin or where to end.

5. After you have engraven one part of your work, it will be proper to ſcrape it with the ſharp edge of your *burniſher* or other *Graver*, carrying it along even with the plate, to take off the roughneſs of the ſtrokes; but in doing this, you muſt take great care not to make ſcratches in it.

6. And that you may the better diſcern that which is engraven, dip your roller made of felt or caſtor in oil, and rub the places *Engraver*.

7. Laſtly, whatſoever ſhall appear to be amiſs, you muſt rub out with the burniſher, and poliſh it again very nicely with your rubber of caſtor and oil, and when you have done you may boil your plate a little while in vinegar and rub it gently with your rubber beforemention'd.

The method of Engraving COPIES *or* PRINTS.

1. If you would have it print the contrary way, rub the backſide of the print with duſt of black-lead, and lay it on the wax'd plate; and trace over all the out-lines of the deſign or print with a needle or drawing point, and you will find all thoſe lines on the wax.

2. Take a drawing point not very ſharp, and with the point thereof ſcratch or trace over every particular line or out-ſtroke; which when you have done it will not be difficult to mark out all the ſhadows as you engrave, having the proportion before you.

3. For copies of letters go over every letter with black-lead, or write them with ungumm'd ink, and clap the paper on the wax'd plate as before directed.

4. Or take a dog's tooth and rub the paper all over with it, not miſſing any place; which done, take the paper off the plate, and ſo will all the letters written with the ungumm'd ink be left exactly upon the wax.

5. Then take a *ſtiff*, and draw all the letters through the wax upon the plate, and take a linen rag or pencil bruſh, and cleanſe the work from the looſe wax, ſo will all the letters be drawn upon the copper.

Of the IMITATION *of copies or prints for* ENGRAVING.

1. Having a piece of bees wax tied up in a fine *Holland* rag, heat the plate over the fire, till it may be hot enough to melt the wax; then rub the plate with the wax tied up in the rag, till you ſee it covered all over with wax (which let be very thin) if it be not even, heat it again by the fire and wipe it over gently with a feather.

2. If you would copy a printed picture, to have it print off the ſame way, clap the print which you would imitate with the printed ſide next to the plate, and having plac'd it very exactly, rub the back ſide of the print with a burniſher, or any thing that is hard, ſmooth and round, which will cauſe it to ſtick to the wax upon the plate; then take off the print (beginning at one corner) gently and with care, leſt you tear it (which may be caus'd alſo by putting too much wax upon the plate) and it will leave upon the wax the perfect proportion in every part.

N B. If the print ſtick too hard to the wax, hold it to the fire, and it will come off with eaſe.

Where take notice, that if it be an old picture, before you lay it upon the wax it will be beſt to track it over in every limb with a black-lead pencil.

ENGRAVING on *precious ſtones* conſiſts in repreſenting igures or devices either in *relievo* or *creux*, i. e. emboſs'd or indented on divers kinds of hard poliſh'd ſtones.

The art of *Engraving* on precious ſtones, is one of thoſe in which the ancients excell'd; as it appears by thoſe antique *agats*, *ornelians* and *onyx's*, which ſurpaſs any thing of that kind the moderns have produc'd.

Pyrgoteles among the *Greeks*, and *Dioſcorides* under the firſt Emperors of *Rome* were the moſt eminent *Engravers* we read of; he former of which was ſo eſteem'd by *Alexander*, that he forbad any body elſe to *Engrave* his head; and the head of *Auguſtus* engraven by the latter was ſo beautiful, that the ſucceeding Emperors choſe it for their ſeal.

All the polite arts having been buried under the ruins of the *Roman* empire; the art of *Engraving* on ſtones met the ſame fate, and was not retriev'd in *Italy*, till the beginning of the fifteenth century; when one *John* of *Florence*, and after him *Dominic* of *Milan*, perform'd works of this kind no way to be deſpis'd.

After their time, ſuch ſculptures became more common in *Europe*, and particularly in *Germany*, from whence a great many were carried into other countries, but theſe fell far ſhort of the beauty of thoſe of the ancients; eſpecially ſuch as were on precious ſtones, for as to thoſe on cryſtal, the *Germans* ſucceedd well enough; as alſo did the *French* after them.

In this branch of *Engraving*, the things made uſe of are the diamond or emery.

The diamond which is the hardeſt and moſt perfect of all recious ſtones, is only cut by itſelf or with its own matter.

That which is firſt to be done, is to cement two rough diamonds to the ends of two ſticks, big enough to hold them teady in the hands; and to rub or grind them againſt each other, till they be brought to the form deſired.

The duſt or powder that is rubb'd off, ſerves afterwards to oliſh them, which is perform'd with a kind of mill that turns wheel of ſoft iron.

The diamond is fix'd in a braſs diſh, and thus apply'd to the wheel is cover'd with diamond duſt, mixt up with oil of olives; and when the diamond is to be cut facet-wiſe, they apply firſt one face then another to the wheel.

Rubies, *ſaphirs* and *topazes* are cut and form'd the ſame way, on a copper wheel, and poliſh'd with tripoli diluted in water.

As to *agates*, *amethiſts*, *emeralds*, *hyacinths*, *granates*, *rubies*, *ſapphirs* and other of the ſofter ſtones, they are cut on a leaden wheel, moiſtened with emery and water, and poliſh'd with tripoli on a pewter wheel.

Lapis, opal, *&c.* are poliſh'd on a wooden wheel.

To faſhion and *Engrave* vaſes of *agate*, *cryſtal*, *lapis*, or the like, they make uſe of a kind of *lathe* like that us'd by pewterers, excepting that as the pewterers lathe holds the veſſels, which are to be wrought with proper tools; that of the *Engraver* generally holds the tools which are turn'd by a wheel, and the veſſels held to them to be cut and *engraven* either in relievo or otherwiſe; the tools being moiſtened from time to time with diamond duſt and oil, or at leaſt emery and water.

To *engrave* the ſmaller works of any of theſe ſtones, after they have been poliſh'd, ſuch as ſeals, *&c.* they uſe a little iron wheel, the ends of whoſe axes are receiv'd within two pieces of iron plac'd upright, as in the turners lathe; to be brought cloſer or ſet further apart at pleaſure.

At one end of one of theſe axes are fitted the proper tools, being kept tight by a ſcrew.

Laſtly, the wheel is turn'd by the foot, and the ſtone apply'd by the hand to the tool, and is ſhifted and conducted as occaſion requires.

The tools are generally of iron, ſometimes of braſs. As to their form it is various; but generally bears ſome reſemblance to chiſſels, gouges, *&c.* ſome have ſmall round-heads like buttons, others like ferrels to take the pieces out, others flat, *&c.*

Theſe tools are not apply'd directly againſt the ſtone, but as it were ſide-ways, thus wearing, and as it were grinding off the ſubſtance.

And ſtill whether it be figures or letters or characters, the manner of application is the ſame.

The tools, as has been before ſaid, are to be frequently moiſtened with diamond duſt and oil of olives.

When the ſtone has been engraven, it is poliſh'd on wheels of bruſhes made of hogs briſtles and *tripoli*.

As for works which are larger and leſs delicate, they make uſe of tools of copper or pewter made on purpoſe to poliſh the ground, or plain parts with *tripoli*, &c. which is apply'd after the ſame manner, as thoſe wherewith the *Engraving* is perform'd.

ENGRAVING *on ſteel* is chiefly employ'd in cutting ſeals, punches, matrices and dies proper for ſtriking coins, medals and counters.

The method of *Engraving* with the inſtruments, *&c.* are the ſame for coins as for medals and counters, all the difference conſiſts in their greater or leſs relievo; the relievo of coins being much leſs conſiderable than that of medals, and that of counters ſtill leſs than that of coins.

Engravers in ſteel commonly begin with punches which are in relievo, and ſerve for making the *creux* or cavities of the matrices and dies.

Though ſometimes they begin with the *creux* or hollowneſs, but then it is only when the intended work is to be cut very ſhallow.

The firſt thing is the deſigning the figures, the next is the moulding them in white wax, of the ſize and depth they are to be; and from this wax the punch is engraven.

This punch is a piece of ſteel, or at leaſt of iron and ſteel mixt; on which the intended figure, whether a head or a reverſe, is cut or chiſſell'd in relievo, before the metal is temper'd or hardened.

The inſtruments us'd in this *Graving* in relievo, which are much the ſame as thoſe wherewith the finiſhing the work in *creux* is effected, are of ſteel.

The principal are *Gravers* of divers kinds, chiſſels, flatters, *&c.*

When the punch is finiſh'd, they give it a very high temper, that it may the better bear the blows of the hammer with which it is ſtruck, to give the impreſſion to the matrice.

That which *Engravers* call *matrice* or *matrix*, is a piece of good ſteel of a cubical form, call'd alſo a dye, on which the relievo of the punch is ſtruck in *creux*.

It is call'd *matrix*, becauſe the coins or medals ſeem to be form'd or generated in the cavities or indentures thereof, as animals are in the *matrix* of their mother.

This ſteel is made hot to ſoften it, that it may the more readily take the impreſſion of the punch; and after ſtriking the punch on it in this ſtate, they proceed to touch up or finiſh the ſtrokes and lines, where by reaſon of their fineneſs, or the too great relievo they are any thing defective, with ſome of the tools abovementioned.

The figure being thus finiſh'd, they proceed to *Engrave* the reſt of the medal, as the mouldings of the border, the engrail'd ring, letters, *&c.*

All which, particularly the letters or engrailment, are perform'd with little ſteel punches, well temper'd and very ſharp. And as they ſometimes make uſe of puncheons to *Engrave* the *creux* of the *matrix*; ſo on ſome occaſions they make uſe of the *creux* of the *matrix* to *Engrave* the relievo of the punch.

To examine and judge of the *Engraving* in *creux*, divers methods have been deviſed to take the impreſſions from it, as the work proceeds.

Sometimes they make uſe of a compoſition of common wax, turpentine and lamp-black; which always retaining its ſoftneſs, eaſily takes the impreſſion of the part it is apply'd to.

But as this only ſerves to ſhew the work by piece-meal, they have recourſe to other methods to ſhew the whole figure.

The firſt is by pouring melted lead on a piece of paper, and clapping the matrice upon it; the ſecond is with melted ſulphur manag'd the ſame way; the third is by laying a piece of ſoft paper on the *Graving*, and over the paper a leaf of lead; when giving two or three blows with a hammer on the lead, the paper takes the impreſſion of the work. But this is only proper where the *Engraving* is ſhallow.

When the *matrix* is quite finiſh'd, they temper it, rub it well with pumice ſtone, and clean out the ſtone again with a hair bruſh; and laſtly, it is poliſh'd with oil and emery. In this condition it is fit for the mill, to be us'd to ſtrike coins, medals, *&c.*

Engraving on ſeals, ſtamps, puncheons, marking irons for goldſmiths, pewterers, book-binders, *&c.* either in relievo or indenture, is perform'd after the manner laſt deſcrib'd.

ENGRAVING PRECIOUS STONES *and* CRYSTAL.

As to *Graving* on precious ſtones and cryſtal, the invention is very ancient as well for the *concave*, as the *relievo*; ſeveral pieces in both kinds are to be ſeen, which ſhews us the wonderful skill of the ancient *ſculptors*, both for the *beauty* of the *deſign* and the excellency of the *work*.

Though they *Engrave* upon almoſt all ſorts of precious ſtones, yet the moſt finiſh'd figures which we meet are upon *onyx's* and *cornelians*, becauſe they found that theſe were more proper than others, on account of their being more firm, more equal and *Engraving* cleanly, and alſo on account of the ſeveral colours that are in the *onyx's* in rows one above another; by which means in their *relievo's*, they ſo ordered it that the ground was of one colour, and the figure of another, as is to be ſeen in ſeveral fine pieces; which are done with the wheel and *emeril* of powder of diamond, and the tools that will be ſpoken of hereafter.

As to thoſe that are engrav'd in *concave*, they are the more difficult, becauſe 'tis a ſort of work in the dark, and it is neceſſary to judge aright of what is done to take proofs every moment by impreſſions in paſte or wax.

This art, which was loſt with others, did not begin to appear again till the time of Pope *Martin* V, the beginning of the fifteenth century.

One of the firſt who undertook to *Engrave* on ſtones was a *Florentine*, call'd *John*, and ſirnam'd *Deelle Corgnivole*, becauſe he uſually work'd on theſe ſort of ſtones; others came after him, who engrav'd all ſorts of precious ſtones.

In this way was the *Dominican* ſirnam'd *de Camei* a *Milaneſe*, who engrav'd the portrait of *Lewis* the *Moor* Duke of *Milan* on a *Ruby*. Others afterwards repreſented greater *figures* on fine ſtones and *cryſtal*.

To *Engrave* on precious ſtones or *cryſtal*, the artificer makes uſe of the diamond; for the diamond which is the moſt perfect and hardeſt of all precious ſtones, cannot be cut but by itſelf.

The workman begins by cementing two rough diamonds at the end of two ſticks, big enough to be held firm in the hand, and rubs the diamonds one againſt another, which the *French* call *egriſer*, and thus he gives them what form and figure he deſires.

In rubbing the two rough diamonds, there falls off a powder into a kind of box, which is what the jewellers make uſe of afterwards to poliſh their diamonds, and they do it by a mill turn'd by an iron wheel; on this wheel is laid an iron pincer, to which anſwers a ſhell of *copper*; the diamond is ſoldered into this ſhell with tin ſodder; and that the pincer may bear the harder on the wheel, a great plate of lead is put upon it.

The wheel on which the diamond is plac'd is ſprinkled with the powder that came from it and oil of olives; when the jeweller cuts with *facets* he changes his tools from time to time, according as his work finiſhes, till it is in its laſt perfection.

When a diamond is to be ſawn into two or more pieces, the workman takes the diamond powder well pounded in a ſteel-mortar, and a peſtle of the ſame; 'tis alloy'd with water and vinegar or ſomething elſe, which is thrown on the diamond as it is cut with iron or copper wire as fine as a hair; there are diamonds cut tools made on purpoſe.

As to *rubies*, *ſapphires* and *topazes*, they are cut and ſprinkled with powder of diamond and oil of olives, the poliſhing is done on another copper wheel with *tripoli* tempered in water.

The workman turns a wheel with one hand, and with the other he forms the ſtone fix'd to a ſtick, faſtened in an inſtrument of wood, call'd a *quadrant*, becauſe 'tis compos'd of ſeveral pieces that quadrate together, and is mov'd by a vice; which turning the ſtick, forms regularly the different figures the lapidary would make on the ſtone.

As for *rubies*, *ballais*, *eſpinelles*, *emeralds*, *jacynths*, *amethyſts*, *granates*, *agats*, and other ſorts of ſtones, which are not ſo hard, they are cut on a leaden wheel, ſprinkled with *emeril* duſt tempered in water; afterwards they are poliſh'd on a tin wheel with *tripoli*, in the ſame manner as abovemention'd, There are other ſorts of ſtones, as the *turquois*, the *geraſol*, and the *opal*, which are poliſh'd on a wooden wheel with *tripoli.*

To make and engrave a *vaſe* or urn of *agate*, *cryſtal* or hard ſtones, the lapidary makes uſe of a machine which they call a tower, the ſame as the pewterers uſe, excepting that inſtead of the pewterers being diſpos'd to hold the pots and veſſels which they work with tools, this is commonly made to hold the different tools that are apply'd to it.

Theſe tools as they turn, form or engrave the veſſels that are preſented to them to be faſhioned and adorned in relievo or *deep*, as the workman pleaſes, who changes his tools according as he has occaſion; he alſo ſprinkles powder of diamond and oil of olives, or ſome other ſuch duſt upon his tools.

There are ſome ſtones that are hardly worth the diamond powder, and work better with other duſt, as the *jacynth*, the *giraſol*, the *turquois*, and ſeveral others that ſeem to be of a fat nature.

When the ſtones are poliſh'd, and are to be engraven either in *relievo* or *deep*, if they are in little pieces as medals or ſeals, the lapidary uſes a machine call'd a *little tower*, which is nothing elſe but an iron wheel, the two ends of whoſe axis turn and are faſtened in two pieces of iron like turners ſpectacles; which open and ſhut as one pleaſes, they being half clove for that purpoſe, and joining again at the top by a *traverſe*, which holds them, or made after any other manner.

At one end of the axis of the wheel are put the tools, which are lock'd and faſtened in with a *vice*, and held ſo by it.

This wheel is turned with the foot, and the hand guides the work againſt the tool, which is of iron; but if the work be large, it is ſometimes of braſs; all tools great or ſmall are made of iron or braſs; ſome are like little whirlegigs, and are call'd ſaws; ſome are term'd ſcabbards, and have a little round head like a button; thoſe that are call'd hinges, are made in the form of an iron ring, and ſerve to lift up the pieces; there are ſome flat, and other different ſorts, which the artificer cauſes to be forg'd of ſeveral ſizes, according to the quality of the work.

The tool is apply'd to the ſtone to be work'd, not directly oppoſite to the end of the tool, but ſide-ways; ſo that the ſaw takes it off in turning againſt, and as it were cutting it.

The ſame way is practis'd in making figures, letters or cyphers, by ſprinkling diamond duſt and oil of olives; and ſometimes when the workman would pierce any thing through, little iron bodkins are fix'd to the tower, at the end of which there is a diamond enchas'd.

When the ſtones are engrav'd in *relievo* or *deep*, they are poliſh'd on wheels of bruſhes made of hog's briſtles and *tripoli*, on account of the delicacy of the work.

And when there is a large field, copper or tin tools are made on purpoſe to poliſh it with *tripoli*, which are apply'd to the little *tower*, after the ſame manner as graving tools.

ENGRAVING *in* RELIEVO *or in* CONCAVE.

There are ſeveral ways of *Engraving* in metals, and upon precious ſtones, for *relievo's* are made in both the one and the other, as well as *graving* in *concave*.

When an artiſt would engrave on ſteel to make medals, he begins with deſigning his ſubject, whether an effigy or device, which he cuts out on wax in *baſs relievo*; then he makes a puncheon, and on one of theſe ends, which ought to be of caſe hardened ſteel, he cuts out of *relief*, the ſame thing he made in wax.

When the puncheon is in its perfection he tempers it to harden it, and then with a mallet or ſome ſuch inſtrument, ſtrikes upon it to make the impreſſion in a ſquared piece of ſteel form'd like a dye; before which, he puts the ſquar'd piece into the fire to ſoften it, and make it more eaſily receive the impreſſion with the puncheon; for being ſtruck hot and cold, it receives in *concave*, what is in *relievo* on one end of the puncheon.

The ſquared piece not taking all the delicate ſtrokes of the puncheon, which commonly is us'd for the raiſing of the *relievo*, there is a great deal more to be done to finiſh the *concave*; which is perform'd with ſteel tools, as little chizels, burins, ſharp gravers, echops, riffloirs, little chizels with files at the end, and ſeveral other tools, ſome to cut, ſome to hew, ſome ſtrait, ſome crooked, which the artificer provides himſelf with, and tempers and rubs on a pumice-ſtone.

As the puncheon is made uſe of, it is from time to time bruſh'd with a ſort of braſs wire.

When the figures are finiſh'd, he engraves the reſt of the medal, as the moulding of the borders, the letters, *&c.* for which he uſes the *tracer*, the *ingraler* and other puncheons, well ſteel'd and tempered; thoſe that are us'd for the mouldings and letters, are ſtruck and impreſs'd on the puncheon with a hammer; for neither the *burin* nor the *little chizel* can engrave letters to the ſame perfection as theſe puncheons.

There are abundance of other little things neceſſary to be done in medals, according to the nature of the deſign, which muſt be ſtruck alſo as well as the letters.

As for the little *chizels*, they are to be touch'd lightly with a mallet, more or leſs as the work requires.

To write or Engrave upon an EGG, PEBBLE, FLINT, *&c.*

Write what you pleaſe with wax or greaſe upon an *egg*, *pebble*, *flint*, &c. then put it into the ſtrongeſt ſpirit of vinegar or oil of ſalt, letting it lie two or three days, and you will find every place about the letters or writing, eaten or conſum'd away; but the places where the wax or greaſe was, not touch'd at all

ENVY is repreſented by a wonderful lean old man, with a pale and meagre face, in whoſe withered cheeks age has wrought deep furrows and wrinkles.

EQUALITY is repreſented in painting by a middle aged woman, holding a pair of ſcales in her right hand, the neſt of a ſwallow feeding her young ones in her left.

The ſcales denote juſtice duly weighing actions, the ſwallow the father of a family dividing his eſtate equally amongſt his children; imitating the ſwallow that never takes from one to give to another.

EQUALITY is alſo repreſented in painting by a lady, lighting two torches at once.

ERASMUS ROTERODAMUS is painted yellow haired, grey eyed, and ſomewhat pale.

ERATO. Takes her name from Ερως, love or deſire, ſhe is one of the nine muſes, and is painted with a ſweet and comely countenance, her temples encompaſs'd with myrtles and roſes; bearing an heart with an iron key, by her ſide *Cupid* winged with a lighted torch; having his bow and quiver at his back.

ERROR is repreſented in painting, by a man in a pilgrim's habit groping out his way blind-fold.

The cloth blinding him ſignifies man's falling into *Error*, when his mind is darkned with worldly concerns; the ſtaff his being apt to ſtumble, if he take not the guide of the ſpirit and of right reaſon.

ESTEEM cannot be repreſented in drawing, *&c.* but by ATTENTION, and by the motion of the parts of the face, which ſeem fix'd upon the object cauſing this attention; for then the eye-brows will appear advanc'd forward over the eyes, being depreſs'd next the noſe, and the other ends a little riſing, the eye very open, and the eye-ball turn'd upwards.

The veins and muſcles of the front, and about the eyes will appear a little ſwell'd, the noſtrils drawing downwards; the cheeks will be moderately ſunk in about the jaws, the mouth a little open, the corners drawing back, and hanging downwards.

ETCHING is a method of engraving on copper, in which the lines or ſtrokes, inſtead of being cut with a tool or graver, are eaten in with *aqua fortis*.

The invention of *Etching*, properly ſo call'd, was much about the ſame time as engraving on copper, by *Albert Durer* and *Lucas*.

Etching has ſeveral advantages over *graving*; as firſt that it is done with more eaſe and expedition; ſecondly, that it requires fewer inſtruments; and thirdly, that it repreſents divers kinds of ſubjects better and more agreeably to nature, as landſcapes, ruins, grounds, and ſmall, faint, looſe, remote objects, buildings, *&c.*

The method of *Etching* is as follows; the copper plate being prepar'd, well hammer'd and poliſh'd as for engraving, then ſcrape ſome chalk, and with a clean linen rag rub it well over the plate, to free it from greaſe; heat it over the fire, and when hot, cover it over with a peculiar ground or varniſh.

When this ground or varniſh is laid on, it is blackened with the ſmoke of a candle, and on this varniſh or ground, thus blackened, the back of the deſign or draught is laid, being firſt rubb'd over with red-chalk.

This deſign being laid on, is to be calk'd or transferr'd upon the varniſh'd ſide of the plate; this is done by tracing over all the lines and ſtrokes of the draught, with a needle or point not very ſharp, which preſſing the paper cloſe down to the ground, cauſes the wax to lay hold of the red-chalk, and ſo brings off with it the marks of the ſeveral lines; ſo that at length it ſhews a copy of the whole deſign in all its correctneſs.

The draught or deſign being thus calk'd, the etcher next proceeds to draw the ſeveral lines and contours with a pointed tool, through the grounds upon the copper.

In doing this, he makes uſe of points of divers ſizes, and preſſes on them more ſtrongly or lightly, according as the ſeveral parts of the figures, *&c.* require more or leſs ſtrength or boldneſs.

Some of theſe points are as fine as needles, for the tender hair ſtrokes, and the remoter fainter objects; and others again as big as bodkins, made oval-wiſe, for the deeper ſhadows, and the figures in the front of the work.

This being done, a rim or border of wax is rais'd round the circumference of the plate to keep in the *aqua fortis*, which is to prevent the *aqua fortis*, from running off at the edges; and then it is poured on the plate ſo prepared.

The ground or varniſh with which the plate is covered being impenetrable by the corroſive quality of the *aqua fortis*, defends the plate from it every where, but in thoſe lines or hatches, cut thro' it with the points; which lying open, the water paſſes thro' them into the copper, and eats into it the depth requir'd; which being done, it is pour'd off again.

It is to be obſerv'd, there are two kinds of *Etching* grounds, the one ſoft and the other hard.

There are likewiſe two kinds of *aqua fortis*, the one white, which is only us'd with the ſoft ground, and is apply'd as has been before directed; and the other green made of vinegar, common ſalt, *ſal ammoniac* and verdegreaſe.

This is us'd indifferently with either kind of ground.

The application of the *green* is ſomewhat different from the white.

This is poured on the plate without any border, which alſo is plac'd a little inclin'd to the end, that the water may run off, which is receiv'd in a veſſel, plac'd underneath.

This pouring on of the *aqua fortis* is ſeveral times repeated, till it has eaten deep enough.

Nor muſt the *aqua fortis*, of which kind ſoever it is, continue equally long, or be poured on equally often on all the parts of the deſign, the remote parts muſt be eaten more ſlightly than thoſe nearer to the view.

For effecting this, they make uſe of a compoſition of oil and greaſe, with which they cover the parts, that are to be bitten no farther.

Or elſe they lay this compoſition on as a defenſative at firſt, and take it off again, when they find it proper.

In a word, they are every now and then covering or uncovering one or another part of the deſign, as occaſion requires.

The management of the *aqua fortis* is the principal thing in the whole art of *Etching*, and that on which the effect of the whole very much depends.

The workman muſt be very obſervant as to the ground, that it don't fail or give way in any part to the *aqua fortis*, and if it does in any place to ſtop up that place with common varniſh.

This muſt alſo be obſerv'd, that a freſh dip of *aqua fortis* muſt never be given, without firſt waſhing out the plate in fair water, and drying it at the fire.

When the *aqua fortis* has perform'd its part, the ground muſt be taken off, and the plate waſh'd and dry'd; after which the artiſt muſt examine it, with his graver in his hand, to touch it up and heighten it, where the *aqua fortis*, &c. has miſs'd.

ETCHING. *The materials uſed therein.*

Etching is an artificial engraving on copper or braſs plates with *aqua fortis.*

The inſtruments uſed in *Etching* are thirteen:

1. *Hard varniſh.* 2. *Soft varniſh.* 3. *Prepar'd oil.* 4. *Aqua fortis.* 5. *Needles.* 6. *Oil ſtone.* 7. *Bruſh pencils.* 8. *Burniſher.* 9. *A ſcraper.* 10. *Compaſſes.* 11. *Ruler.* 12. *A Stift.* 13. *The frame and trough.*

Etching needles.

Chuſe needles of ſeveral ſizes, ſuch as will break without bending, and of a fine grain; then take good round ſticks of firm wood (that is not apt to ſplit) in length about ſix inches, and about the thickneſs of a large gooſe quill, at the end of which fix your needles, ſo that they may ſtand out of the ſticks about a quarter of an inch, or ſomething better. Of theſe needles you ought to have twenty at leaſt; which you may alſo fix in ſuch ſticks as to have a pencil at the other end.

How to whet the points of the needles with the oil ſtone.

If you would whet them round, the points muſt be whetted ſhort upon the oil-ſtone (not as ſowing needles are) turning them round as you whet them, as turners do. If you would have them ſloping, firſt make them blunt upon the oil-ſtone; then holding them firm and ſteady, whet them ſloping on one ſide only till they come to a ſhort and roundiſh oval.

The bruſh pencil is to cleanſe the work, wipe off duſt, and to ſtrike the colours even over the ground or varniſh, when laid upon the plate.

The burniſher is a well hardened piece of ſteel, ſomewhat roundiſh at the end. Its uſes have been mentioned before.

The ſcraper is one of the inſtruments fitted for clearing the plate of all deep ſcratches or ſtrokes which the burniſher will not take away; they are firſt to be ſcrap'd out with the ſcraper (carrying an even hand, that you may not make more work) and aftherwards what has been ſcrap'd is to be burniſhed.

The compaſſes. Their chief uſe is in meaſuring diſtances, or ſtriking circles, or ſome part or portion of them, where you would have your work to be exact.

The ruler is uſed chiefly in drawing all the ſtrait hatches or lines of the deſign upon the plate, or to mark out diſtances upon ſtrait lines.

The ſtiſt is uſed for drawing through all the out-moſt lines or circumferences of the print, pattern, or drawing, which is etched after.

To make the frame.

The frame is an entire board, about the top and ſides of which is faſtened a ledge about two inches broad, to keep the *aqua fortis* from running off from the ſides when it is poured on; the lower end of this board is to be plac'd in the trough, leaning ſloping againſt a wall or ſome other thing, in which are to be plac'd ſix ſeveral pegs of wood to reſt the plate upon.

The Trough is made of a fine, firm piece of elm or oak, ſet upon four legs, the hollow of which is in width four inches, and of ſuch length as may be fit for uſe.

The hollow muſt be ſomething deeper in the middle that the water running thither may fall thro' a hole (made there for that purpoſe) into an earthen pan well leaded.

The inſide of this board and trough muſt be covered with a thick oil colour, to hinder the *aqua fortis* from eating or rotting the board.

The poliſhing of the plate.

Beſides what has been ſaid of poliſhing the copper plate for engraving (ſee ENGRAVING) take the directions following.

1. The plate being well planiſh'd or forg'd, chuſe the ſmootheſt ſide for poliſhing; then fix it upon a board a little declining, and rub it firmly and evenly all over with a piece of grindſtone, often throwing water upon it, ſo long till there remain no dints or flaws or marks of the hammer.

2. Waſh it clean, and with a piece of good pumice-ſtone, rub it croſs-wiſe to the former, till the marks of the grind-ſtone are rubb'd out.

3. Then waſh it clean again, and rub it with a fine hone and water croſs-wiſe to the former, till the marks of the pumice-ſtone are rubb'd out.

4. Waſh it again, and with a piece of charcoal without knots (being heated red hot, and quenched in urine, the outſide having been pared off) rub the plate with water, till all the ſmall ſtrokes of the hone diſappear.

5. If there ſhall yet remain any ſmall ſtrokes or ſcratches, rub them out with the end of the burniſhing iron; but if they happen to be pretty deep, then you muſt make uſe of your ſcraper to ſcrape them out, and afterwards burniſh them, and laſtly, charcoal them as before directed, till the plate is glaz'd, and then it is finiſhed.

To make the hard varniſh for ETCHING.

Take *Burgundy* or *Greek* pitch ten ounces, of *colophony* or roſin the ſame quantity, of *nut oil* eight ounces; melt the pitch or roſin in an earthen pot over a gentle fire; then put in the oil, and let them boil for the ſpace of half an hour; then ſet it on a more ſlow fire, and let it cool a little, till it appear like a glewy ſyrup; then cool it a little more, and ſtrain it, and when it is almoſt cold, put it into a glaz'd pot for uſe. This will keep good for ſeven years and more.

To make the ſoft varniſh for ETCHING.

Take of *virgin's wax* ſix ounces, *maſtick* in drops four ounces, *aſphaltum* two ounces; grind the *maſtick* and *aſphaltum* ſeparately very fine, and ſift them thro' a fine hair ſieve; then melt the wax in an earthen pot, and ſtrew in the *maſtick* and *aſphaltum*, keeping ſtirring upon the fire, till they be well diſſolv'd and mixt, which will be in about half an hour; then let it cool a little, and pour into a baſon of fair wuter (but do not let the dregs go in; and having wetted your hands, take it out of the water, and make it up into rolls before it is cold.

Or thus; Take of *virgin's wax* eight ounces, *aſphaltum* four ounces; *amber* and *maſtick* of each two ounces; reduce the three laſt into a fine powder; mix them over a gentle fire, ſo that it may not be burnt; then take it off the fire, pour it into a veſſel of fair water, and make it up into rolls or balls. and keep it from the duſt; when you have occaſion to uſe it, take a quantity of it, and tie it up in a piece of taffety or ſilk, and uſe it according as you will be directed hereafter.

Or thus; If it be for a *red* ground, take red-lead, grind it very well, and temper it with varniſh.

Or thus; For another *red* ground, take *red-lead* or *vermilion*, and having ground it very well, grind it again with linſeed oil, and lay it on very thin.

Or thus; Take *virgin's wax* two ounces, *aſphaltum*, *amber*, and *maſtick*, of each one ounce (but if the weather be cold, but half an ounce of *maſtick*) roſin and ſhoemakers pitch of each half an ounce, common varniſh a quarter of an ounce; melt the wax in an earthen veſſel; then put in the other ingredients by degrees; mix them well, and make it up into rolls or balls, and keep it from duſt for uſe.

Or thus; For a *white* ground, take roſin four ounces, *wax* two ounces; melt them together, adding *Venetian* ceruſs finely ground four drams.

Or thus; For a *black* ground, take *aſphaltum* two ounces, *bees wax* one ounce, melt them together, and while they are warm, lay it thinly on with a lawn rag.

To make the prepar'd oil.

Heat *oil olive* in an earthen veſſel, and put into it a ſufficient quantity of *ſheeps ſuet* tried (ſo much that it being dropt upon a cold thing, the matter will be a little hardened and firm) let them boil together for the ſpace of an hour, till they become of a reddiſh colour, leſt they ſhould ſeparate when they come to be uſed.

This mixture is to render the fat more liquid, and prevent it from cooling too faſt; for the fat alone would be no ſooner on the pencil, but it would grow cold. You muſt likewiſe remember not to fail in putting more oil in winter than in ſummer.

To make aqua fortis.

Take of diſtill'd white wine vinegar one quart, of *ſal armoniack* and bay ſalt of each four ounces, of *verdegreaſe* almoſt three ounces; put all theſe together into a pretty large earthen veſſel well glaz'd; cover the pot cloſe; ſet it over a quick fire (taking care that they do not boil over) give it as ſpeedily as you can two or three great walms, and no more, when it is ready to boil, uncover the pot, and ſtir it now and then with a bit of ſtick; but take care that it does not boil over; when it has boil'd take it off, and ſet it by to cool, keeping it ſtill cloſe covered; and when it is cold, put it into a glaſs bottle with a glaſs ſtopple.

If it proves too ſtrong in *Etching*, you may weaken it with a glaſs or two of the ſame vinegar you made it of.

The method of uſing the hard varniſh.

1. Heat the plate (being poliſhed over a chafing diſh of coals) and with a little ſtick take ſome of the firſt varniſh, and put a drop of it on the top of your finger, and with it touch the plate lightly at equal diſtances, laying on the varniſh equally, and heating the plate again as it grows cold, preſerving it carefully from getting any duſt or filth; then with the ball of your thumb, dab it upon the plate, ſtill wiping your hand over all, you make it more ſmooth and equal.

And in this great care muſt be taken that the varniſh be not too thick upon the plate, nor your hand ſweaty.

2. When you have done this, take a great lighted candle that burns clear, with a ſhort ſnuff (placing the corner of the plate againſt a wall) and holding the varniſh'd ſide of the plate downwards over the candle, as cloſe as you can, (not to touch the varniſh) guide the flame all over the plate, till it is all perfectly black'd; let it not get any duſt nor filth till it is dry.

3. Hang the varniſh'd plate to dry over a charcoal fire with the varniſh'd ſide upwards, which will ſmoak; when the ſmoak abates, take away the plate, and with a pointed ſtick, ſcratch the near ſide of it; and if the varniſh comes eaſily off, hang it over the fire again for a little while, till the varniſh will not come off too eaſily; then take it from the fire, and ſet it by to cool.

If the varniſh ſhould be too hard, caſt cold water on the backſide of the plate to cool it, that the heat may not make it too hard and brittle.

In the next place, place it on a low deſk, or ſome ſuch like thing, and cover that part which you do not work on with a ſheet of fine white paper, and a ſheet of brown paper over that, on which you may reſt your hand to keep it from the varniſh.

If you make uſe of a ruler, lay ſome part of it upon the paper, that it may not rub off the varniſh; and take an eſpecial care, that no duſt or filth get in between the paper and the varniſh, for that will hurt it.

The method of ETCHING.

1. In making lines or hatches, ſome bigger, and ſome leſſer, ſtrait or crooked, you muſt uſe ſeveral ſorts of needles, bigger or leſſer, as the work requires.

2. The large lines are made by leaning hard on the needle, the point being ſhort and thick (but a round point will not cut the varniſh clear) or by making divers lines or hatches one very cloſe to another, and then by paſſing over them again with a thicker needle; or by making them with an indifferent large needle, and letting the *aqua fortis* lie the longer thereon.

The beſt needles for this work are thoſe that are whetted ſloping with an oval, becauſe their ſides will cut that which the round ones will not.

3. If your lines or hatches ought to be of an equal thickneſs from end to end, lean on the needle with an equal force; leaning lightly where you would have the lines or ſtrokes fine or ſmall, and heavier where you would have the lines appear deep or large, whereby the needle may have ſome impreſſion on the copper.

4. If the lines or hatches are too ſmall, paſs over them again with a ſhort round point of ſuch a bigneſs as you would have the line of, leaning ſtrongly where you would have the line deep.

5. The manner of holding the needle with oval points (which are moſt proper to make large and deep ſtrokes) much reſembles that of a pen, only the flat ſide whetted is uſually held towards the thumb; but they may be uſed with the face of the oval turned towards the ſide of the little finger.

6. If you would end with a fine ſtroke, you ought to do that with a very fine needle.

7. In uſing the oval points hold them as upright and ſtrait in your hand as you can, ſtriking your ſtrokes firmly and freely, for that will add much to their beauty and clearneſs.

8. In landſcapes in places fartheſt off from the ſight, as alſo neareſt the light, uſe a very ſlender point, leaning ſo lightly with your hand, as to make a ſmall faint ſtroke.

9. Be careful while you are working to bruſh off all the duſt which you work off with the needles.

10. But this you muſt take notice of, that you ought to be able to copy any drawing or print exactly, and to draw after good heads of plaiſter or figures, according to your own fancy, and skilful in ſhadowing every thing exactly according to art: and therefore, when you imitate plaiſter, be ſure to take the true out-lines or circumferences, and taking notice how the ſhadow falls, to do it very faint and ſoft as the deſign requires.

11. Therefore it is convenient that you be able to hatch with the pen, exactly after good prints or copies, and when you can perfectly do that, and draw after plaiſter, then to imitate the life; but before you draw after the life, you muſt be very exact and true in your out-lines or circumferences.

12. Now to take the outmoſt lines in any drawing or print upon the ground of the plate, you muſt ſcrape a little white-lead upon the back-ſide; then take a feather, and rub it over every where alike, and ſhake off that which remains looſe.

Having done this, lay the print on the plate, on that ſide the lead is, and faſten the four corners of it to the plate with a little ſoft wax; then take the *ſtiſt*, and draw upon the print all the outmoſt lines or circumferences exactly; when you have done this, take off the print from the plate, and all the ſame out-lines and circumferences, which you drew upon the print with the *ſtiſt*, will be exactly found upon the ground.

13. Then you muſt obſerve very exactly how your original or pattern is ſhadowed, and how cloſe the hatches are joined; how they are laid, and which way the light falls or comes in; and be ſure that you make the light fall one way; if the light falls ſideways in the print, you muſt hatch the other ſide darkeſt, which is fartheſt from the light, and ſo place the lights altogether on one ſide, and not confuſedly, part on one ſide, and part on another.

14. Take notice how cloſe all the hatches join, how they incline, and which way they twiſt and wind, which follow as exactly as you poſſibly can; but before you begin to hatch or ſhadow, you muſt not fail to draw all the out-lines with a needle upon the ground as artificially as you can, which ſhadow with your needles of ſeveral ſorts, according to the original.

15. When you are to make a broad ſtroke, then break off the point of your needle, and whet it upon the oil ſtone four ſquare till it comes to a point; if fine ſtrokes are to be hatched, then fine pointed needles muſt be uſed; if middle ſiz'd ſtrokes, then you muſt break off the point of a middle ſiz'd needle, and whet it as directed before, and the ſame is to be done in all the ſizes; but ſome artiſts in making a bold or broad ſtroke, firſt of all hatch it fine, and afterwards make it broader by degrees.

The method of ETCHING LANDSCAPES.

1. Hatch that which is neareſt to the eye darkeſt, and make it looſe or decline its ſhadows by degrees, making that fainteſt which is fartheſt off.

2. The ſame method is to be obſerv'd in *Etching* a sky, for that which is neareſt to the eye muſt be ſhadowed darkeſt; but in general as faint and ſoft as may be, loſing itſelf gradually, as before directed; and by how much the nearer the sky comes to the ground, by ſo much more looſe and faint muſt it be; and when they both meet as it were together, the sky muſt be quite loſt.

3. When the work has been hatched as exactly as you poſſibly can with the needles in imitation of the drawing or print;

compare them well together, and if you find any thing omitted, ſupply it; if amiſs, amend it.

4. In *Etching* a piece of *perſpective*, after either a drawing or a print, beſure you ſhadow that which is neareſt to the eye the perfecteſt and ſtrongeſt; and that which is farther from it muſt decline in length, breadth and height, according to art and proportion, letting the ſhadows looſe and grow fainter and fainter gradually, till they are in a manner loſt.

Of Etching or engraving letters.

1. Screw the copper plate (after it has been made fit for *Etching*) to a hand vice, which hold over a charcoal fire till it be warm; then rub a piece of virgin wax all over the plate, covering it all over very evenly.

2. Then with a ſtiff duck's wing feather (not ruffled) ſtroke it over the wax, laying it even and ſmooth in all parts alike, and let it cool.

3. Then the letters or writing being written on paper with ungummed ink made with vermilion, lay the written ſide downwards upon the waxed plate, and faſten the four corners with a little ſoft wax, placing the writing ſo exactly, that the lines may run ſtrait.

4. Then rub the backſide of the paper all over with a dog's tooth, taking care not to miſs any part; then pull the paper off the plate, and you will find all the letters written on the paper left exactly upon the wax.

5. Then draw all the letters through the wax on the plate with a ſtift, and afterwards cleanſe the work from the looſe wax, that you have rais'd by ſo drawing it, with a linen rag or pencil bruſh, and thus will all the letters be drawn on the copper plate.

6. Then pour upon the plate good *aqua fortis*, and it will be *Etched*; but if you take off all the wax and engrave it, the letters will be much more exact and fine, eſpecially if your gravers be well ground and ſharp towards the points; and then whetted ſmooth upon a good oil-ſtone, and the graving be well performed; for *Etching* will not perform writing ſo neatly as engraving.

The method of uſing AQUA FORTIS.

1. If there are any ſtrokes into which you would have the *aqua fortis* to eat, or any places where the varniſh has been rubb'd off, melt a little of the prepar'd oil (before mentioned) and cover thoſe places pretty thick with a pencil.

2. Then dip a bruſh pencil or rag into the prepared oil, and rub the backſide of the plate all over, that the *aqua fortis* may not hurt it, if any ſhould happen to fall on it.

3. Warm the plate gently, or dry it by a fire to dry up all the humidity, which it may poſſibly have contracted by reaſon of the air, before you put your *aqua fortis* upon it; and to prevent the varniſh from breaking up upon the firſt pouring on the *aqua fortis.*

4. Place the plate in the trough (as before directed) and having the *aqua fortis* in a pot, pour it upon the plate, beginning at the top, ſo moving your hand that it may run all over the plate; do this eight or ten times; then turn the plate corner-wiſe, and pour the *aqua fortis* on it that way ten or twelve times; after this, turn it again corner-wiſe the other way, pouring on the *aqua fortis* eight or ten times as before, doing thus ſeveral times for the ſpace of eight or ten minutes or nore, according as the *aqua fortis* is in ſtrength.

For there muſt be leſs time allowed to hard and brittle copper, for pouring on the *aqua fortis*; but more to the ſoft.

5. Great nicety and care muſt be uſed in pouring on the *aqua fortis*, as occaſion ſhall require, and as the work ſhall be, caſting it on at ſeveral times and on ſeveral places; often where you would have it very deep, and fewer where leſs deep; and leſs yet where light, and leſſer yet where lighter; and thoſe places that are ſo light as it can ſcarcely be ſeen once or twice. Waſh it with water, and cover it where you would have it lighter.

6. Having thus covered the plates as occaſion requires for the ſecond time, place the plate on the frame as aforeſaid, and pour your *aqua fortis* on it for full half an hour.

7. Then waſh it with water, and dry it, covering the places which require lightneſs or faintneſs (that they may be proportionable to the deſign) then pour on the *aqua fortis* for the laſt time, more or leſs, according to the nature of your work, and the deepneſs that it requires.

8. You may rub off the varniſh or ground, as occaſion in your work requires with a charcoal, to ſee whether the *aqua fortis* has eaten deep enough, by which you may judge of the ſpace of time that you are afterwards to employ in pouring on the *aqua fortis*, in the works you will have to do; which if the ſhadows require much depth, or ought to be very black, the *aqua fortis* ought to be poured on (at the leaſt time) for an hour or better; yet you muſt remember, that no certain ſpace of time can be fixt or limited for this.

The method of finiſhing the work.

1. All the former operations being perform'd, waſh the plate with fair water, and ſet it wet upon the fire till the mixture be well melted, and then wipe it very clean on both ſides with a linen cloth, till it is thoroughly cleans'd of all the mixture.

2. Take charcoal of willow, take off the rind, put fair water on the plate, and rub it with the charcoal as if you were to poliſh it, and it will take off the varniſh.

But you muſt take care that the coal be free from all knots and roughneſs, and that no ſand or filth fall upon the plate.

3. Add two third parts of fair water to one third part of common *aqua fortis*, and dipping ſome linen rag in it, rub the plate all over, and this will take away the diſcoloration of it, and recover its former beauty.

4. Then wipe the plate with dry linen rags ſo as to take off the aforeſaid water, and holding it a little before the fire, put on a little olive oil, and with the furr of an old beaver roll'd up, rub the plate all over, and in the laſt place wipe the plate well with a dry cloth.

5. Then if any places need touching with the graver, as it frequently happens, eſpecially where it is to be very deep or black, carefully perfect them, and then the plate is fit to be carried to the rolling preſs.

The manner of uſing the ſoft varniſh.

1. Having made the plate ready by clearing it with a charcoal and fair water, waſh it well and dry it, and then rub it well over with fine white chalk ſcraped and a fine rag, not touching it with your fingers.

2. Lay the plate over a chafing diſh of ſmall-coal, yet ſo that the fire may have air; then having tied up ſome of the ſoft varniſh in a fine rag, rub it up and down the copper plate, ſo that it melting in a ſmear or cover (neither too thin nor too thick) then make it as ſmooth as poſſibly you can all one way with a ſtiff duck's feather, and then croſswiſe, till it lies ſmooth and even.

But care muſt be taken that the plate be not too hot, for if it lies till the ground ſmoaks, the moiſture will be dried up, and that will cauſe the ground to break or fly up and ſpoil the work.

3. Then having ready ſome ceruſs or white lead ground with gum water, ſo that it is of a convenient thickneſs for ſpreading on the copper; ſtrike the plate with it croſs over twice or thrice till it is ſmooth with a large pencil or ſmall bruſh, and then gently ſmooth the white with a larger bruſh (made of ſquirrels tails) and afterwards ſet it by till it is dry.

4. Or, if you pleaſe, you may black the varniſh with a candle (as before directed) and then, if it be cold, warm it over the fire, till the varniſh begins to melt, that the ſmoke may melt into the ground, ſo that it will not rub off with your hand.

The method of ETCHING *upon ſoft varniſh.*

1. This way of *Etching* is the ſame as that of the hard varniſh, but you muſt take great care not to hurt the varniſh. This may be done by placing two little boards on the ſides of the plate, and laying another thin one croſs over them, but ſo as not to touch the plate. This will ſerve to reſt your hand while you are working.

2. Then lay the plate on a desk (if you pleaſe) for by that means the ſuperfluous matter may fall away of it ſelf.

3. But if the deſign you have to transfer on the plate is any copy or print, ſcrape ſome *red-chalk* all over the backſide of it, and upon that ſcrape ſome ſoft *charcoal*, till it mingle with the chalk, and rub it all over till it be fine and even with a large ſtiff pencil; and then lay it upon the plate, and draw over the out-ſtrokes with a blunt needle.

And as you work, you need not ſcratch hard into the copper; but only ſo that you may ſee the needle go thro' the varniſh to the copper.

4. Be ſure whenever you leave your work, to take care to wrap the plate up in a paper, to keep it from hurt, and from being injured by the air, which will dry the varniſh; and in winter time, wrap it up in a piece of woollen as well as paper; for if the froſt get to it, it will cauſe the varniſh to riſe from the copper in the eating in.

There will alſo one inconvenience attend the letting the varniſh lie too long upon the plate before the work is finiſhed; for the ſpace of three or four months will conſume the moiſture, and ſo ſpoil all.

5. It will be beſt to mark the deſign upon the ſoft varniſh with black-lead or chalk, if the ground is white; but with red-*chalk*, if the ground be black.

6. The deſign being trac'd on the varniſh, caſt a little fair warm water upon the varniſh'd plate, and then rub upon the white lead, to moiſten it all over with a ſoft clean ſpunge; and afterwards waſh the plate to take away the whiting, and dry it.

7. In the laſt place, waſh it all over with *aqua fortis* mix'd with fair water, and this will take away the whiting, which then waſh with common water and dry it; and thus will the plate be prepar'd for *aqua fortis.*

The manner of uſing the aqua fortis *and finiſhing the work.*

1. Put ſoft wax (red or green) round the brims of the plate (being firſt drawn into a long roll or ſtring) and raiſe it above the varniſh the length of half a barley corn's length; ſo that placing the plate level, the water being pour'd upon the plate, may be retain'd.

But that you may be ſure that the *aqua fortis* ſhall not run out, heat a knife in the fire, and ſear the wax round about under the plate very cloſe; and be ſure you faſten the wax as near to the edges of the plate as you can conveniently.

2. Mix ſix ounces of ſingle or common varniſh with two ounces of common water, and pour it gently upon the plate, ſo that it may cover it fully and all over; and ſo will the fuller hatchings be full of bubbles, while the fainter will appear white, not making any ſudden operations to the view.

You muſt take notice of this, *That in order to weaken the* aqua fortis, *you may mix it with* vinegar *or a little of that* aqua fortis, *which has been us'd before*; *or if the liquor be too ſtrong, it will make the work very hard, and ſometimes make the ground to break up*; *the deeper the* aqua fortis *lies the harder it will eat.*

3. When you have perceiv'd the water has operated a little while, pour it off into a glaz'd earthen veſſel, to be kept to be us'd with ſome other, and throw fair water on the plate to waſh away the *aqua fortis*, and afterwards dry the plate.

4. Where you would have the cut to be faint, tender or ſweet, cover thoſe places with prepared oil, and then cover the plate again with *aqua fortis* as before, leaving it on for eight or ten minutes, or longer; then pour off the *aqua fortis* as before, and waſh and dry the plate, covering with the prepar'd oil ſuch other places, which you would not have ſo deep as the reſt.

5. In the laſt place, put on the *aqua fortis* again, and let it lie on for the ſpace of half an hour (more or leſs) and then pour it off, and waſh the plate with fair water as before.

6. *As you would have your lines or ſtrokes to be deeper and deeper, ſo cover the ſweeter or fainter parts dy degrees with the prepar'd oil, that the* aqua fortis *may lie the longer on the deepeſt ſtrokes.*

7. Then take off the border of wax, and heat the plate ſo that the oil and varniſh may be thoroughly melted; then wipe them clean off with a linen cloth, and afterwards rub the plate over with oil of olives, and a roller made up of a piece of old beaver hat; and if there be need, touch it up with the graver.

8. But if, at laſt, you ſhall have forgotten any thing, then rub the plate well with crums of bread, that no filth or oil may remain upon it.

9. Then heat the plate over a charcoal fire, and ſpread the ſoft varniſh upon it with a feather (as before) ſo that the hatchings may be fill'd with varniſh; black it, and then touch it over again, or add what you intend.

10. Make your hatchings with ſuch needles as the work requires, taking care to cover the firſt graving on the plate with

prepar'd oil, before you lay on the *aqua fortis* (leſt the varniſh ſhould not have covered all over) then let the *aqua fortis* eat into the work, and when it has ſo done, cleanſe the plate as before.

11. When you have cleanſed the plate, if you perceive that the *aqua fortis* has not eaten deep enough in ſome places, you muſt mend thoſe defects with the graver.

12. That you may know whether the *aqua fortis* has eaten deep enough, after it has lain a quarter of an hour, pour it off from the plate into a glaſs, and waſh it with a little fair water, and ſcrape off a little bit of the ground with a knife, where it is hatcht, and may be leaſt prejudicial to the work; and if you find it has not eaten deep enough, cover the bare place of the plate with prepar'd oil, and put on *aqua fortis* again, letting it lie till you think it deep enough.

13. Or you may mix it with ſome new *aqua fortis*, if you think what you have already uſed be too weak; and you will at length arrive at a certainty by many trials and practice.

14. Or you may make a trial upon a waſte piece of *copper* rudely hatch'd, pouring the *aqua fortis* both upon the plate, and that at one and the ſame time; and after a ſufficient ſeaſon, take off a little piece of the ground with a knife, from the waſte piece of copper, where it is hatch'd; and if it be not deep enough, cover it again with the prepared oil, and make a new trial, and after this manner proceed till you find the *aqua fortis* has eaten deep enough.

15. Waſh the plate with a little fair water before you warm it, for otherwiſe the *aqua fortis* will ſtain the place.

16. If the ground has been broken up in any place, pour the *aqua fortis* off the plate, waſh it with fair water, and cover it with prepar'd oil, and then pour on the *aqua fortis* again, and it will preſerve the plate from injury.

17. That you may make the *aqua fortis* work harder or ſofter, you muſt cover thoſe places of the plate which you would have to be faint (after the *aqua fortis* has been once pour'd off the plate) with the prepar'd oil, which oil muſt be us'd by degrees, as you would have the work fainter.

This will be found neceſſary in *Etching* landſcapes, becauſe they muſt gradually loſe and ſtand at a diſtance.

ETERNITY is repreſented in painting in the form of a fair lady, having three heads, ſignifying the time paſt, preſent, and to come; ſhe holds in her left hand a circle, pointing with the fore-finger of her right hand up to heaven. The circle ſhews, that *Eternity* hath neither beginning nor end.

In the medals of *Trajan*, *Eternity* was figured red, ſitting upon a ſphere, with the ſun in one hand, and the moon in the other. By her ſitting poſture is ſignified perpetual conſtancy.

In the medals of *Fauſtina*, ſhe was drawn with a veil, and in her right hand the globe of the world.

Claudius deſcribes *Eternity* by a ſerpent, encompaſſing round with his body the cave or den wherein it lieth; ſo that making a circle, it holds in its mouth the end of its tail, which with the *Egyptians* was the emblem of the year.

ETHICKS is repreſented in painting by a lady of a ſober, grave aſpect, holding the inſtrument *archipendulum* in one hand, with the other a lion bridled.

The lion demonſtrates that moral philoſophy ſubdues and curbs the paſſions, teaches to obſerve a medium between virtue and vice; the inſtrument ſhews the juſt equilibrium, not to tranſgreſs to either of the extremes.

E. V. Stands for *Eneas Vighi* of *Parma*, who engraved the works of *Roſſi*, *Titian*, *Buonaroti*, *Julio Clovio*, and of *Baccio Bandinelli.*

E. V. H. Stands for *Eſacah Van Hulſen.*

EVENING is repreſented in painting by a babe, ſtill winged, of a duskiſh carnation colour, in a poſture of flying towards the weſt; a bright ſtar on his head; in his right hand an arrow, in his left a bat.

His flying ſhews it to be the *Evening* twilight; the ſtar is *Heſpherus*; the arrow ſignifies the vapours attracted by the ſun, which having nothing to ſuſtain them, fall down, and are more or leſs noxious, according to the places high or low.

EUROPE is repreſented in painting by a lady in a very rich habit of ſeveral colours, ſitting between two croſs *Cornucopia's*, the one full of all ſorts of grain, and the other of black and white grapes; holding a temple in her right hand, and with the fore finger of the left hand points at ſcepters and crowns; a horſe amongſt trophies of arms; a book alſo with an owl on it; many muſical inſtruments by her, and a pallet for a limner with pencils.

All which ſhews it to be the principal part of the world for religion, arts, and arms.

EURUS. The eaſt wind is repreſented in painting by a youth with puff'd and blown cheeks (as all the other winds muſt be) having wings on his ſhoulders, his body like a tawney-more; upon his head a red ſun.

EURYTHMY in painting and ſculpture; a certain majeſty, elegance and eaſineſs appearing in the compoſition of divers members, or parts of a Body or painting, and reſulting from the fine proportions thereof.

EUTERPE, ſo call'd for giving delight, and is repreſented crowned with a garland of flowers, holding in each hand ſundry wind inſtruments.

EXERCISE is repreſented in painting by a man in his juvenile years, cloathed in a ſhort garment of divers colours; his arms naked, a clock on his head, a golden circle in one hand, in the other a ſcroul inſcribed ENCYCLOPÆDEIA. He has winged feet; at his right ſide are ſeveral ſorts of arms, at his left divers inſtruments of agriculture.

His youth denotes his being able to ſuſtain the fatigues of Exerciſe; his naked arms his being in a readineſs; *Encyclopædia* ſignifies the circle of all ſciences, which are attained by Exerciſe, as well as skill in arms; the clock denotes Exerciſe by divers motions of the wheels that diſtinguiſh the time and hour.

EXPRESSION, ſays Monſ. *Le Brun*, is a lively and natural reſemblance of the things which we have to repreſent. It is a neceſſary ingredient in all the parts of painting, and without it no picture can be perfect; it is that which deſcribes the true characters of things. It is by that the different natures of bodies are diſtinguiſhed, that the figures ſeem to have motion, and that every thing therein counterfeited appears to be real.

It is as well in the *colouring*, as in the deſign; it ought alſo to be obſerv'd in the repreſentation of landſcapes, and in the compoſition of the figures.

Expreſſion is alſo a part, which marks the motions of the ſoul, and renders viſible the effects of paſſion.

EXPRESSION in painting is a term us'd to ſignify the natural and lively repreſentation of the ſubject of the ſeveral objects intended to be ſhewn.

The *Expreſſion* conſiſts principally in repreſenting the human body and all its parts in the action ſuitable to it; in exhibiting in the face the ſeveral paſſions proper to the figures, and obſerving the motions they expreſs on the external parts. See ATTITUDE.

The term *Expreſſion* is frequently confounded with that of *paſſion*; but there is a difference betwixt them, which is this: that *Expreſſion* is a general term, which implies a repreſentation of an object, agreeably to its nature and character, and the uſe or office it is to have in the work; and *paſſion* in painting is a motion of the body, accompanied with certain diſpoſitions or airs of the face which mark an agitation in the ſoul; ſo that every *paſſion* is an *Expreſſion*; but every *Expreſſion* is not a paſſion.

The laws or rules of Expreſſion *in painting.*

Expreſſion being, as has been ſaid, a repreſentation of things according to their character, may be conſidered either with reſpect to the *ſubject* in general, or to the *paſſions* peculiar thereto.

I. With reſpect to the *ſubject*, it is to be obſerv'd.

1. That all the parts of the compoſition are to be transform'd or reduced to the character of the ſubject, ſo as they may conſpire to impreſs the ſame ſentiment, paſſion or idea: thus *e gr.* in a repreſentation of joy and peace, every thing ſhould appear calm and agreeable; of war, turbulent, and full of terror, &c.

2. In order to this, if any circumſtance occurs in hiſtory or deſcription, that would invert or take from the idea, it muſt be ſuppreſt, unleſs eſſential to the ſubject.

3. To this end, the hiſtory or fable is to be well ſtudied in the authors who deſcribe it, in order to conceive its nature and character truly, and impreſs it ſtrongly on the imagination, that it may be diffus'd and carried through all the parts of the ſubject.

4. A liberty may be taken to chuſe favourable incidents in order to diverſify the *Expreſſion*, provided they are not contrary to the principal image of the ſubject, or the truth of hiſtory.

5. The harmony of the *tout enſemble* ought to be particularly regarded, both with regard to the actions, and the light and colour. See CLAIR OBSCURO.

6. The modes and cuſtoms are to be obſerv'd, and every thing made conformable to time, place and quality.

7. The three unities of time, place and action ought to be obſerv'd, that is, nothing ſhould be repreſented in the ſame picture, but what is tranſacted, or paſſes at the ſame time, and may be ſeen at the ſame view.

II. With reſpect to the particular *paſſions* and *affections* of the ſubject, the rules are,

1. That the paſſions of brutes be few and ſimple, and have almoſt all an immediate reſpect, either of ſelf-preſervation or the propagation of the kind; but in human kind there is a greater variety. Hence a man can move his eye brows, which are immoveable in brutes; and alſo can move the pupil of his eye every way, which brutes cannot.

2. *Children*, who not having the uſe of reaſon, act much after the ſame manner as brutes, and expreſs the motions of their *paſſions* directly, and without fear or diſguiſe.

3. Tho' the *paſſions* of the ſoul may be *expreſſed* by the actions of the body, 'tis in the face they are principally ſhewn, and particularly in the turn of the eye and motions of the eye-brows.

4. There are two ways of lifting up the eye-brows, the one at the middle, which likewiſe draws up the corners of the mouth,

and argues pleaſant motions; the other at the point next the noſe, which draws up the middle of the mouth, and is the effect of grief and ſadneſs.

5. The paſſions are all reducible to joy and ſadneſs, either of which is either ſimple, or mixt, and paſſionate.

6. Joy cauſes a dilatation of all the parts; the eye-brows riſe in the middle, the eyes half open and ſmiling, the pupil ſparkling and moiſt, the noſtrils a little open, the cheeks full, the corners of the mouth drawn a little upwards, the lips red, the complexion lively, the forehead ſerene.

7. Paſſionate joy proceeding from love, ſhews the forehead ſmooth and even, the eye-brows a little elevated on the ſide the pupil is turn'd to, the eyes ſparkling and open, the head inclin'd towards the object, the air of the face ſmiling, and the complexion ruddy.

That proceeding from deſire ſhews it ſelf by the body, the arms extending towards the object in uncertain and unquiet motions.

8. *Simple ſadneſs* is expreſs'd by the body being caſt down, the head careleſly hanging aſide, the forehead wrinkled, the eye-brows rais'd to the midſt of the forehead, the eyes half ſhut, the mouth a little open, the corners downwards, the under-lip pointing and drawn back, the noſtrils ſwell'd and drawn downwards.

That mixt with fear cauſes the parts to contract and palpitate, the members to tremble and fold up, the viſage to be pale and livid, the point of the noſtrils elevated, the pupil in the middle of the eye, the mouth opened at the ſides, and the under lip drawn back.

In that mixt with anger, the motions are more violent, the parts all agitated, the muſcles ſwell'd, the pupil wild and ſparkling, the point of the eye-brows fixt towards the noſe, the noſtrils open, the lips big and preſs'd down, the corners of the mouth a little open and foaming, the veins ſwell'd, and the hair erect.

That with *deſpair* reſembles the laſt, only more exceſſive and diſorder'd.

9. The hand has a great ſhare in the *Expreſſion* of the ſentiments and paſſions; the raiſing of the hands conjoin'd towards heaven *expreſſes* devotion; wringing the hands, grief; throwing them towards heaven, admiration; fainting, and dejected hands, amazement and deſpair; folding the hands, idleneſs; holding the fingers indented, muſing; holding forth the hands together, yielding and ſubmiſſion; lifting up the hand and eye to heaven, calling God to witneſs; waving the hand from us, prohibition; extending the right hand to any one, pity, peace,

and ſafety; ſcratching the head, thoughtfulneſs; laying the hand on the heart, ſolemn affirmation; holding up the thumb, approbation; laying the fore-finger on the mouth, bidding ſilence; giving with the finger and thumb, a giving ſparingly; and the fore-finger put forth, and the reſt contracted, to ſhew and point at, as much as to ſay, *This is he.*

10. The *ſex* of the figure is to be regarded; and man, as he is of a more vigorous and reſolute nature, ought to be *expreſs'd* in all his actions freer and bolder than women, who are to be more reſerv'd and tender.

11. So alſo as to the *age*, the different ſtages whereof incline to different motions both of body and mind.

12. The condition, or honours a perſon is inveſted with, renders their actions more reſerv'd, and their motions more grave, contrary to the populace, who obſerve little conduct or reſtraint, giving themſelves for the moſt part up to their paſſions, whence their external motions become rude and diſorderly.

Laſtly, in *ſpirits*, all thoſe corruptible things muſt be retrench'd, which ſerve only for the preſervation of life, as veins, arteries, *&c.* only retaining what may ſerve for the form and beauty of the body.

In *angels*, particularly as ſymbolical figures, their offices and virtues are to be mark'd out, without any draught of ſenſual paſſions; only appropriating their characters to their functions of powers, activity, and contemplation.

EXPRESSION. Whatever the general character of the ſtory is, the picture muſt diſcover it throughout, whether it be joyous, melancholy, grave, terrible, *&c.* The nativity, reſurrection and aſcenſion, ought to have the general colouring, the ornaments, back-ground, and every thing in them riant, and joyous, and in a crucifixon, interment, or a *pietà* [The Bleſſed Virgin with a dead Chriſt.] the contrary.

But a diſtinction muſt be made between grave and melancholy, as in a holy family (of *Rafaelle*'s deſign at leaſt) where the colouring is brown, and ſolemn, but yet altogether the picture has not a diſmal air, but quite the contrary; beſides another holy family of *Rubens*, painted as his manner was, as if the figures were in a ſunny room; if *Rafaelle*'s colouring had been the ſame with *Reubens*'s on this occaſion, doubtleſs it would have been the worſe for it. There are certain ſentiments of awe, and devotion, which ought to be rais'd by the ſight of pictures of that ſubject, which that ſolemn colouring contributes very much to.

There is a fine inſtance of a colouring proper for melancholy ſubjects, in a *pietà* of *Van Dyck:* that alone would make one not only grave, but ſad at firſt ſight; and another inſtance of a coloured drawing of the fall of *Phaeton* after *Giulio Romano*, which ſhews how much this contributes to the *Expreſſion*. 'Tis different from all other colourings, and admirably adapted to the ſubject; there is a reddiſh purple tinct ſpread throughout, as if the world was all invellop'd in ſmouldring fire.

There are certain little circumſtances that contribute to the *Expreſſion*. Such an effect have the burning-lamps that are in the cartoon of healing at the beautiful gate of the temple; one ſees the place is holy, as well as magnificent.

The large fowl that are ſeen on the fore-ground in the cartoon of the draught of fiſhes have a good effect. There is a certain ſea-wildneſs in them, and as their food was fiſh, they contribute mightily to expreſs the affair in hand, which was fiſhing. They are a fine part of the ſcene.

The robes, and other habits of the figures; their attendants, and enſigns of authorty, or dignity, as crowns, maces, &c. help to expreſs their diſtinct characters; and commonly even their place in the compoſition. The principal perſons and actors muſt not be put in a corner, or towards the extremities of the picture, unleſs the neceſſity of the ſubject requires it. A Chriſt, or an apoſtle muſt not be dreſs'd like an artificer, or a fiſherman; a man of quality muſt be diſtinguiſh'd from one of the lower orders of men, as a well-bred man always is in life from a peaſant. And ſo of the reſt.

Every body knows the common or ordinary diſtinctions by dreſs; but there is one inſtance of a particular kind which I will mention, as being likely to give uſeful hints to this purpoſe, and moreover very curious. In the cartoon of giving the keys to St. *Peter*, our Saviour is wrapt only in one large piece of white drapery, his left arm, and breaſt, and part of his legs naked; which undoubtedly was done to denote him now to appear in his reſurrection-body, and not as before his crucifixion, when this dreſs would have been altogether improper. And this is the more remarkable, as having been done upon ſecond thoughts, and after the picture was perhaps finiſh'd, which may be proved by a drawing of this cartoon, very old, and probably made in *Rafaelle's* time, though not of his hand, where the Chriſt is fully clad; he has the very ſame large drapery, but one under it that covers his breaſt, arm, and legs down to the feet. Every thing elſe is pretty near the ſame with the cartoon.

That the face, and air, as well as our actions, indicate the mind, is indiſputable. 'Tis ſeen by every body in the extreams on both ſides. For example; let two men, the one a wiſe man, and the other a fool, be ſeen together dreſs'd, or diſguis'd as you pleaſe, one will not be miſtaken for the other, but diſtinguiſh'd with the firſt glance of the eye; and theſe characters are ſtamp'd upon the face, ſo as to be read by every one when in the utmoſt extremes, they are ſo proportionably when more, or leſs remov'd from them; and legible accordingly, and in proportion to the skill of the reader.

The like may be obſerv'd by good, and ill-nature, gentileneſs, ruſticity, *&c.*

Every figure and animal muſt be affected in the picture as one ſhould ſuppoſe they would, or ought to be. And all the expreſſions of the ſeveral paſſions, and ſentiments muſt be made with regard to the characters of the perſons moved by them. At the raiſing of *Lazarus*, ſome may be allow'd to be made to hold ſomething before their noſes, and this would be very juſt, to denote that circumſtance in the ſtory, the time he had been dead; but this is exceedingly improper in the laying our Lord in the ſepulchre, although he had been dead much longer than he was; however *Pordenone* has done it.

When *Apollo* fleas *Marſyas*, he may expreſs all the anguiſh, and impatience the painter can give him, but not ſo in the caſe of St. *Bartholomew.*

That the Bleſſed *Mary* ſhould ſwoon away through the exceſs of her grief is very proper to ſuppoſe, but to throw her in ſuch a poſture as *Daniel da Volterra* has done in that famous picture of the deſcent from the croſs, is by no means juſtifiable.

Polydore, in a drawing of the ſame ſubject, has finely expreſs'd the exceſſive grief of the Virgin, by intimating 'twas otherwiſe inexpreſſible: her attendants diſcover abundance of paſſion, and ſorrow in their faces, but hers is hid by drapery held up by both her hands: the whole figure is very compos'd, and quiet; no noiſe, no outrage, but great dignity appears in her ſuitable to her character.

In that admirable cartoon of St. *Paul* preaching, the expreſſions are very juſt and delicate throughout; even the background is not without its meaning; 'tis expreſſive of the ſuperſtition St. *Paul* was preaching againſt. But no hiſtorian, or orator can poſſibly give ſo great an idea of that eloquent, and zealous Apoſtle as that figure of his does; all the fine things related as ſaid, or wrote by him cannot; for there I ſee a perſon, face, air, and action, which no words can ſufficiently deſcribe, but which aſſure me as much as thoſe can; that that man muſt ſpeak good ſenſe, and to the purpoſe. And the different ſentiments of his auditors are as finely expreſs'd; ſome appear to be angry, and malicious, others to be attentive, and reaſoning upon the matter within themſelves, or with one another; and one eſpecially is apparently convinc'd. Some before the Apoſtle; the others are behind him, not only as caring leſs for the preacher, or the doctrine, but to raiſe the apoſtolick character, which would loſe ſomething of its dignity, if his maligners were ſuppoſed to be able to look him in the face.

Elymas the ſorcerer is blind from head to foot, but how admirably is terror and aſtoniſhment expreſs'd in the people preſent, and how variouſly, according to the ſeveral characters! The Proconſul has theſe ſentiments but as a *Roman*, and a gentleman; the reſt in ſeveral degrees and manners.

The ſame ſentiments appear alſo in the cartoon of the death of *Ananias*, together with thoſe of joy and triumph which naturally ariſes in good minds upon the ſight of the effects of divine juſtice, and the victory of truth.

Nor is the expreſſion in another drawing of the deſcent of the Holy Ghoſt leſs excellent than the other parts of it. The Bleſſed Virgin is ſeated in the principal part of the picture, and ſo diſtinguiſh'd as that none of the company ſeems to pretend to be in competition with her; and the devotion and modeſty with which ſhe receives the ineffable gift is worthy of her character. St. *Peter* is on her right hand, and St. *John* on her left; the former has his arms croſs'd on his breaſt, his head reclin'd, as if aſham'd of having deny'd ſuch a maſter, and receives the inſpiration with great compoſure; but St. *John* with a holy boldneſs raiſes his head, and hands, and is in a moſt becoming attitude; the women behind St. *Mary* are plainly of an inferior character. Throughout there is great variety of expreſſions of joy and devotion, extremely well adapted to the occaſion.

I will add one example more of a fine expreſſion, becauſe though 'tis very juſt, and natural, it has been done by *Tintoret*, in a drawing of his. The ſtory is our Saviour's declaration to the Apoſtles at ſupper with him, that one of them ſhould betray him: ſome are moved one way, and ſome another, as is uſual, but one of them hides his face, dropp'd down betwixt both his hands, as burſt into tears from an exceſs of ſorrow that his Lord ſhould be betray'd, and by one of them.

In portraits it muſt be ſeen whether the perſon is grave, gay, a man of buſineſs, or wit, plain, gentile, *&c.* each character muſt have an attitude, and dreſs; the ornaments and back-ground proper to it; every part of the portrait, and all about it muſt be expreſſive of the man, and have a reſemblance as well as the features of the face.

If the perſon has any particularities as to the ſet or motion of the head, eyes, or mouth, (ſuppoſing it be not unbecoming) theſe muſt be taken notice of, and ſtrongly expreſs'd. They are a ſort of moving features, and are as much a part of the man as the fix'd ones; ſome raiſe a low ſubject, and contribute more to a ſurpriſing likeneſs than any thing elſe. *Van Dyck* in a picture has given a briſk touch upon the under-lip, which makes the form and ſet of the mouth very particular, and doubtleſs was an air which *Don Diego de Guſman*, whoſe portrait it is, was accuſtom'd to give himſelf, which an inferior painter would not have obſerv'd, or not have dar'd to have pronounc'd, at leaſt ſo ſtrongly; but this, as it gives a marvellous ſpirit, and ſmartneſs, undoubtedly gave a proportionable reſemblance.

If there be any thing particular in the hiſtory of the perſon, which is proper to be expreſs'd, as it is ſtill a farther deſcription of him, it is a great improvement to the portrait, to them that know that circumſtance. There is one inſtance of this in a picture of *Van Dyck* made of *John Lyvens*, who is drawn as if he was liſtening at ſomething; which refers to a remarkable ſtory in that man's life. The print is in the book of *Van Dyck*'s heads: which book, and the heads of the artiſts in the lives of *Giorgio Vaſari*, are worth conſidering, with regard to the variety of attitudes ſuited to the ſeveral characters, as well as upon other accounts.

Robes or other marks of dignity, or of a profeſſion, employment or amuſement, a book, a ſhip, a favorite dog, or the like, are hiſtorical expreſſions common in portraits, which muſt be mention'd on this occaſion; and to ſay more of them is not neceſſary.

There are ſeveral kinds of artificial expreſſions indulg'd to painters, and practis'd by them, becauſe of the diſadvantage of their art in that particular, in compariſon of words.

To expreſs the ſenſe of the wrath of God with which our Bleſſed Lord's mind was filled when in his agony, and the apprehenſion he was then in of his own approaching crucifixion, *Frederico Barocci* has drawn him in a proper attitude, and not only with the angel holding the cup to him, (that is common) but in the back-ground you ſee the croſs and flames of fire. This is very particular, and curious.

In the cartoon where the people of *Lycaonia* are going to ſacrifice to St. *Paul* and *Barnabas*, the occaſion of all that is finely told.

The man who was heal'd of his lameneſs is one of the forwardeſt to expreſs his ſenſe of the divine power which appear'd in thoſe Apoſtles; and to ſhew it to be him, not only a crutch is under his feet on the ground, but an old man takes up the lappet of his garment, and looks upon the limb which he remembred to have been crippled, and expreſſes great devotion and admiration; which ſentiments are alſo ſeen in the other with a mixture of joy.

When our Saviour committed the care of his church to St. *Peter*, the words he us'd on that occaſion are related by *Rafaelle*, who

who has made him pointing to a flock of ſheep, and St. *Peter* to have juſt receiv'd two keys. When the ſtory of *Joſeph's* interpretation of *Pharaoh*'s dream was to be related, *Rafaelle* has painted thoſe dreams in two circles over the figures; which he has alſo done when *Joſeph* relates his own to his brethren. His manner of expreſſing God's dividing the light from darkneſs, and the creation of the ſun, and moon, is altogether ſublime. The prints of thoſe laſt mention'd pictures are not hard to be found, they are in what they call *Rafaelle*'s bible, but the paintings are in the *Vatican*; the beſt treaſury of the works of that divine painter, except *Hampton-Court*.

The hyperbolical artifice of *Timanthes* to expreſs the vaſtneſs of the *Cyclops* is well known, and was mightily admired by the ancients; he made ſeveral ſatyrs about him as he was aſleep, ſome were running away as frightned, others gazing at a diſtance, and one was meaſuring his thumb with his *Thyrſus*, but ſeeming to do it with great caution leſt he ſhould awake.

This expreſſion was copied by *Giulio Romano* with a very little variation. *Correggio*, in his picture of *Danaë*, has finely expreſs'd the ſenſe of that ſtory, for upon falling of the golden ſhower, *Cupid* draws off her linen covering, and two loves are trying upon a touch-ſtone a dart tipp'd with gold.

I will add but one example more of this kind, and that is of *Nicholas Pouſſin* to expreſs a voice, which he has done in the baptiſm of our Saviour by making the people look up, and about, as 'tis natural for men to do when they hear any ſuch, and know not whence it comes, eſpecially if it be otherwiſe extraordinary, as the caſe was in this hiſtory.

Another way practis'd by painters to expreſs their ſenſe, which could not otherwiſe be done in painting, is by figures repreſentative of certain things. This they learn'd from the ancients, of which there are abundance of examples, as in the *Antonine* pillar, where to expreſs the rain that fell when the *Roman* army was preſerv'd by the prayers of the *Theban* legion, the figure of *Jupiter Pluvius* is introduc'd. *Rafaelle* in the paſſage of *Jordan*, has repreſented that river by an old man dividing the waters, which are roll'd and tumbled very notably.

I will add but one way of expreſſion more, and that is plain writing.

Polygnotus, in the paintings made by him in the temple of *Delphos*, wrote the names of thoſe whom he repreſented.

The old *Italian* and *German* maſters improv'd upon this; the figures they made were ſpeaking figures, they had labels coming out of their mouths with that written in them which they were intended to be made to ſay; but even *Rafaelle* and *Annibale Carracci*, have condeſcended rather to write than leave any ambiguity,

biguity, or obſcurity in their work: thus the name of *Sappho* is written to ſhew 'twas ſhe, and not one of the muſes, intended in the *Parnaſſus*: and in the gallery of *Farneſe*; that *Anchiſes* might not be miſtaken for *Adonis*, *Genus unde Latinum* was written.

In the cartoon of *Elymas* the ſorcerer, it does not appear that the pro-conſul was converted, otherwiſe than by the writing; nor do I conceive how it was poſſible to have expreſs'd that important circumſtance ſo properly, any other way.

In the *peſt* of the ſame maſter, grav'd by *Marc Antonio*, there is a line out of *Virgil*, which, as 'tis very proper (the plague being that deſcrib'd by that poet, as will be ſeen preſently) admirably heightens the *Expreſſion*, though without it 'tis one of the moſt wonderful inſtances of this part of the art that perhaps is in the world in black, and white, and the utmoſt that human wit can contrive; there is not the moſt minute circumſtance throughout the whole deſign, which does not help to expreſs the miſery there intended to be ſhewn; but the print being not hard to be ſeen, need not be deſcrib'd.

Writing is again uſed in this deſign; in one part of it you ſee a perſon on his bed, and two figures by him; this is *Æneas*, who (as *Virgil* relates) was adviſed by his father to apply himſelf to the *Phrygian* Gods to know what he ſhould do to remove the plague, and being reſov'd to go, the deities appear to him, the moon ſhining very bright, (which the print repreſents;) here *effigies ſacræ divom Phrygiæ* is written, becauſe otherwiſe, this incident would not probably have been thought on, but the group would have been taken to be only a ſick man, and his attendants.

You muſt not expect to find the true airs of the heads of that great maſter *Rafaelle* in prints, not even in thoſe of *Marc Antonio* himſelf. Thoſe are to be found only in what his own inimitable hand has done, of which there are many unqueſtionably right in ſeveral collections here in *England*; particularly in thoſe very admirable and copious ones of the Duke of *Devonſhire*, and the Earl of of *Pembroke*; but *Hampton-Court* is the great ſchool of *Rafaelle!*

Beſides him, I know of none of the old maſters that are remarkable for *Expreſſion*, unleſs for particular ſubjects; as *Michael Angelo* for infernal, or terrible airs; and amongſt others, the drawing he made for the *cartoon* in the famous picture of his laſt judgment, which is admirable in this kind; others of later times have ſucceeded well in this part of the art, as *Domenichin*, and *Rembrandt*; but theſe are the principal; only for portraits, and herein, next to *Rafaelle*, perhaps, no man has a better title to the preference than *Van Dyck*; no not *Titian* himſelf, much leſs *Rubens*.

But there is no better ſchool than nature for *Expreſſion.* A painter therefore ſhould on all occaſions obſerve, how men look, and act, when pleas'd, griev'd, angry, *&c.*

Of EXPRESSING *the* PASSIONS *in the* COUNTENANCE.

Love is expreſs'd by a clear, fair and pleaſant countenance, without clouds, wrinkles or unpleaſant bendings; giving the forehead an ample height and breadth, with a majeſtick grace; a full eye with a fine ſhadow at the bottom of the eye-lid, and a little at the corner; a proportionable noſe; noſtrils not too wide; a clear cheek made by ſhadowing it on one ſide, and a ſmiling mouth, made by a thin upper-lip, and ſhadowing the mouth-line at the corners.

Fear is expreſs'd by making the eyes look hollow, heavy and downwards, thin fallen cheeks, cloſe mouth and careleſs ſtaring hair about the ears.

Envy is beſt decyphered by only the hanging of the cheeks, and a pale countenance; and ſometimes by grinding of the teeth.

Let every paſſion be repreſented according to its outward appearance, as it is in thoſe perſons in whom it reigns, obſerving the rules laid down in the article IMITATION of *Draughts.*

If you would aim at an exquiſiteneſs in this art, you muſt endeavour to chuſe out the beſt actions for every purpoſe, in reſtraining the luxurious fancy of nature by a deliberate diſcretion, which you ought to have in the idea; by the benefit of which you will finiſh your deſign with delight and contentment; always expreſſing in each member a certain hidden reſemblance of the principal motions which affect the eye, and ſoul of the ſpectators, and merit the chiefeſt commendation.

To expreſs a paſſion truly, you ought to give every thing and part its proper motion, or that which beſt befits your intention; which is nothing elſe but the agreement of proportion and form to the nature and matter of the action or paſſion intended, wherein conſiſts the whole ſpirit and life of the art, which by artiſts is ſometimes call'd the *fury*, ſometimes the *grace*, and ſometimes the *excellency* of the art. For hereby an evident difference is made between the *living* and the *dead*; the *fierce* and the *gentle*; the *wiſe* and the *ſimple*; the *ſad* and the *merry*; and in a word diſcover all the ſeveral paſſions and geſtures, which the body of a man is able to perform.

But theſe things are impoſſible ever to be exactly done in a picture, till you have firſt intenſly viewed and conſidered the life, that by this means you may come as near the life as poſſibly may be; to which adding art withal, you will meet with no motions ſo potent, which you will not be able artificially to imitate.

Theſe things will be the more exactly accompliſh'd, if you are viewing and continually practiſing what you have ſeen.

By this means you will unawares attain an exact habit of doing well, and lively expreſs all geſtures, actions and paſſions ſubject to natural bodies.

The *paſſions* of the mind are certain motions proceeding from the apprehenſion of ſome moving or powerful object, now this apprehenſion is threefold, *viz. ſenſitive*, *rational* and *intellectual.*

From theſe three there ariſe three principal paſſions of the mind, *viz. pleaſures of the ſenſes*, *moral virtues* or *vices*; and *a pious religious life*, or *irreligious and wicked.*

To EXTEND *or* CONTRACT *a* PICTURE.

1. Encompaſs the picture with one great ſquare, which divide into as many little ones as you pleaſe; having done this according as you would have your picture, either greater or leſs, make another ſquare greater or leſs, which divide into the ſame number of equal ſquares, which let be drawn with a black-lead plummet.

2. Take your black-lead pen, and draw the picture by little and little, paſſing from ſquare to ſquare (by the example of the pattern) until you have gone all over with it; obſerving that in what part of the ſquare the picture lies, you draw the like part in the ſquare anſwerable thereto, till you have finiſh'd the whole.

3. Then draw it over with a pen, in which ſecond drawing of it, you may eaſily mend any fault, and ſhadow it at pleaſure.

4. Laſtly, when it is thoroughly dry, rub it over with the crum of white bread, and it will take off all the black-lead ſtrokes, ſo will the draught remain fair upon the paper.

EYES. For the drawing of *Eyes.* See the PLATE.

EYES, [to paint in miniature] ſhade the white of the *Eyes*, with a faint blue and light fleſh colour, and do the corners on the ſides of the noſe with *vermilion* and *white*, with a ſmall ſtroke of *carmine.* All this is ſoftened with a mixture of *vermilion*, *carmine*, and *white*, and a very little *oker.*

The *iris* of the *Eye* muſt be a mixture of *ultramarine* and *white*, this little more in quantity than the other, adding thereto a little *biſtre*, if it be of a kind of a light hazel or a little black, if it is too grey.

The *pupil* or ſight of the *Eye* muſt be done with *black*, and the *iris* ſhaded with *indigo*, *biſtre* or *black*, according to the colour it is of; but of what colour ſoever it is, it will be proper to draw a fine circle of *vermilion* round the ſight, which blended with the reſt in finiſhing gives life to the *Eye.*

The circumference of the *Eyes*, that is the ſight and laſhes, are to be done with *biſtre* and *carmine*, when they are ſtrong, particularly the upper part, which muſt be afterwards ſoftened with red or blue mixtures mentioned at the latter end of the article of CARNATION, that the whole may appear of a piece and continued.

Having done this, give a ſmall touch of pure white, upon the ſight of the *Eye* next to the light, which makes it ſhine and alive.

You may alſo heighten the white of the *Eye* next the light.

The EYE-BROWS *and the* BEARD are colour'd like the ſhades of the fleſh, (See CARNATION) and are finiſh'd with *biſtre*, *oaker* or *black*, according to the colour they are of, drawing them with fine ſtrokes as they ought to lie, in exact imitation of nature; and heighten the lights with *oaker*, *biſtre*, a little *vermilion* and a good deal of *white*.

JOHANNES *ab* EYK, commonly call'd JOHN of BRUGES, born at *Maſſeyk* on the river *Maez*, in the *Low-Countries* anno 1370, was a diſciple of his brother *Hubert* and a conſiderable painter; but above all things famous for having been the happy inventor of the art of painting in oil *anno* 1440, (thirty years before printing was found out by *John Guttemberg* of *Strasburg)* he died *anno* 1441, having ſome years before his deceaſe communicated his invention to his ſiſter *Margaret*.

F.

F. B. ſtands for *Francis Briccio* of *Bologna*, painter; he engrav'd the pieces of *Lewis Carracci*.

F. B. B. Father *Bonaventura Biſi* of *Bologna*, call'd *il Padro Piteorino* or the painting friar.

F. B. V. I. ſignifies *Frederic Barocci* of *Urbino*, *inv.* he ſometimes inſtead of the I put F, *i. e. fecit*.

The PROPORTION *of a man of ten* FACES.

From the top of the head to the ſole of the foot is divided into ten equal parts.

1. The firſt diſtance begins at the top of the head, and reaches to the root of the chin.

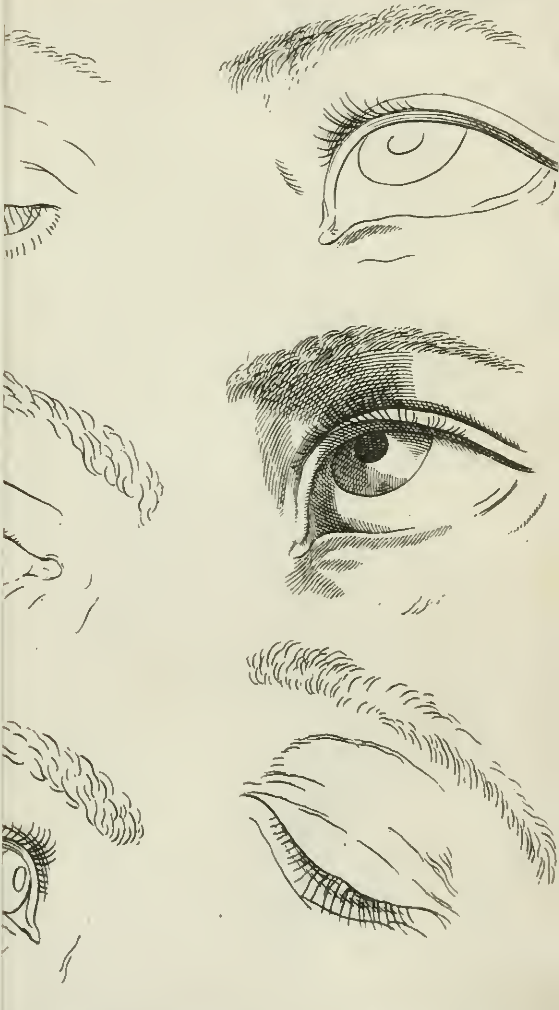
2. The ſecond from thence to the throat pit.

3. The third from thence to the parting of the breaſts.

4. The fourth from thence to the privities, which is juſt the middle of the length of the body.

From thence to the ſole of the foot are five parts more; two of which are between the privities and the mid-knees; and three more to the ſole of the foot.

The firſt of the ten parts, which is for the face is to be divided into three equal parts; the firſt beginning at the upper-part of the



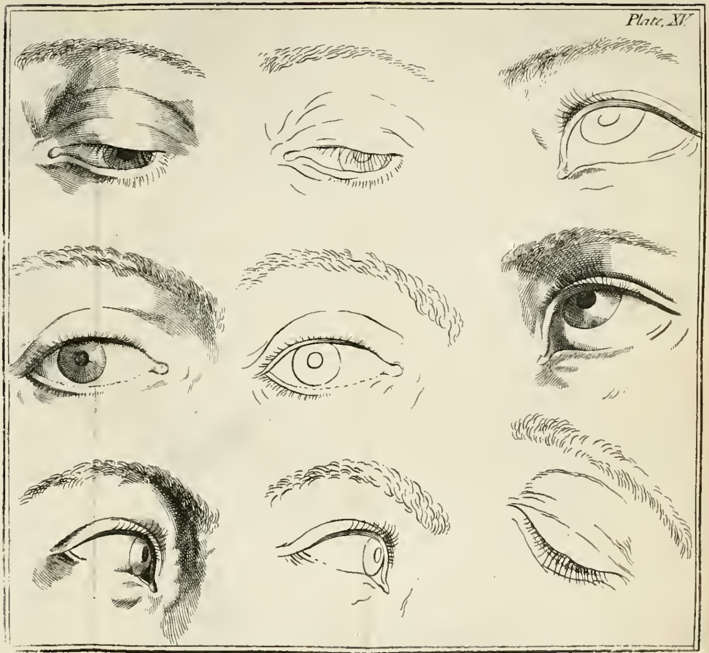


Plate. XV.

the forehead, and ending upon the upper croſs line of the eye-brows.

The *ſecond* diſtance reaches from thence to the bottom of the noſe.

The *third* reaches to the bottom of the chin, which is the firſt and uppermoſt diviſion.

Now in a fore-right, be ſure to place the eyes the length of one eye diſtance from another; and the length of one eye the bottom of the noſe is to be.

The breadth of this body alſo conſiſts of ten *Faces*, viz. between the extremities of both the middle fingers, when the arms are extended or ſpread abroad; and it is thus divided,

1. The *hand* from the *end* of the *middle-finger* to the *wriſt*, is the length of a *Face* (or one of the tenth parts.)
2. From the *wriſt* to the *elbow* a *Face* and a half.
3. From the *elbow* to the *ſhoulder* joint two *Faces*.
4. From thence to the throat pit one *Face*.

The hands have the proportion of one *Face*.

The *nipples* muſt be plac'd at the diſtance of a *Face* and a half from each other, equal to the diſtance between the *wriſt* and the *elbow*.

The compaſs of the head from the eye-brows to the neck behind, is double to the length of the whole head.

The compaſs of the *waſte* is the diſtance of three *Faces* to the diameter of it, and is all one with the trunk of the body.

The circumference of the body under the armpits, and the ſpace between them and the wriſts, anſwer in a double proportion, and is agreeable to half of the body.

The proportions of a young man of nine FACES.

A ſlender young body of nine heads is equal to nine times the ſpace between the top of the head, and the end of the chin, that being a ninth part of the length of the whole body, and thence back again to the root of the hair a tenth or eleventh part. By which way ſoever you draw it, this ſpace is alſo divided into three equal parts, the firſt of which makes the forehead, the ſecond the noſe, the third the chin.

However in a *Face* for the eleventh part is a tuft of hair which is uſually expreſt, ſo that the forehead becomes lower by a third part; which rule the ancient *Grecians* always obſerv'd.

The proportions of a man of eight FACES.

Firſt draw a ſtrait perpendicular line of the length you deſign the figure; divide this line into eight equal parts, the uppermoſt part of which is the length of the head, in which you muſt take care to be very exact, becauſe the whole body muſt anſwer in proportion to it.

Make that eighth part into an oval, dividing the oval into four equal ſpaces; the firſt is to be for the *hair*.

To draw a fore-right FACE. In doing this it will be neceſſary to form a perfect oval, which divide in the midſt with a line, the longeſt way or perpendicular line, this line divide into three equal parts, allowing a fourth of one of the three parts for the hair on the forehead; the firſt for the forehead, the ſecond for the noſe, the third for the chin.

In the midſt of theſe form the mouth, always being ſure to make the eyes in one line, the croſs-line of the noſe and mouth muſt always correſpond with the croſs-line, where the eyes are plac'd, and the eyes muſt be the length of the diſtance from one eye to another; and their inward corners muſt be exactly perpendicular over the outſide of the noſtrils; but to make the ears in a fore-right *Face* proportionable, they muſt be much foreſhortened by fore-ſhortening; that is the eye does not ſee the full latitude of it. The proportion of the length of the ear is to be from the eye-brows to the bottom of the noſtrils; and then join the neck with the hair, in ſuch a manner as may be moſt pleaſant to the eye. See the plates for FACES and HEADS.

If you would draw a *Face* after the life, that it may reſemble the party you draw it after, take notice in the firſt place, of the phyſiognomy or circumference of the *Face*, whether it be round or long, fat or lean, big or little, ſo that in the firſt place, you muſt be ſure to take the right phyſiognomy and bigneſs of the *Face*; and in caſe it be a fat *Face*, you will perceive the cheeks to make the ſide of the *Face* to ſwell out, and ſo make the *Face* look as if it were ſquare; and if it be neither too fat nor too lean, it will be round for the moſt part; but if it be a lean *Face*, the jaw-bones will ſtick out, and the cheeks fall in, and the *Face* will be long and ſlender.

But remember when you draw the outmoſt circumference of a *Face*, that you muſt take the head and all with it, or otherwiſe you may be deceiv'd in drawing the true bigneſs of a *Face*.

You muſt likewiſe take a diligent obſervation of all the maſter touches, which give the ſpirit and life to a *Face*, and diſcovers the grace or diſpoſition of the mind; wherein lieth the whole grace of the work.

You may eaſily diſcern a ſmiling countenance in the corners of the mouth, when they turn up a little: a ſtay'd and ſober countenance may be diſcern'd in the eyes, when the upper eyelids come ſomewhat over the balls of the eyes.

A frowning countenance is eaſily diſcern'd on the fore-head, by the bending of the eye-brows, and ſome few wrinkles about the top of the noſe.

Plate. XVI.

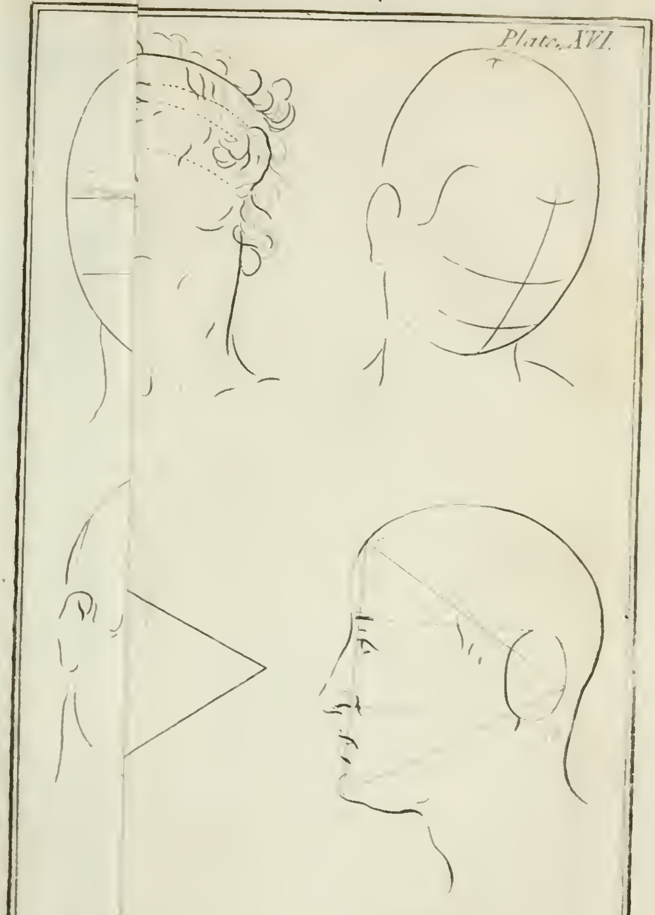
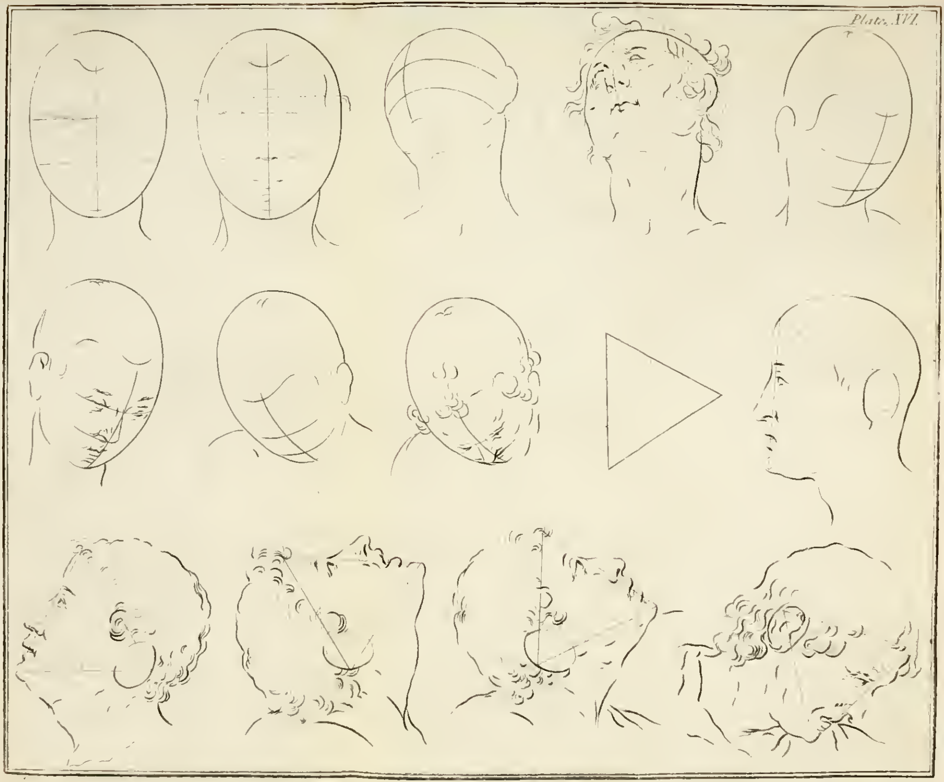


Plate. XVI.



A laughing countenance is eaſily diſcerned all over the *Face*; and an angry countenance is diſcern'd by extraordinary frowning; there are alſo ſome touches about the eyes and mouth, which muſt be diligently obſerv'd, which give life and ſpirit to a *Face*. See the plates of the various *paſſions* in their proper places.

The painting of a FACE.

The cloth tablet, *&c.* being prepared you muſt lay a ground or primer of fleſh colour, before you begin your work, and that muſt be tempered according to the complexion of the *Face* to be drawn; if the complexion be fair temper *white*, *red-lead* and *lake*; if an hard ſwarthy complexion, mingle with the *white* and *red* a little fine *maſticote* or *Engliſh oaker*.

But you muſt take notice of this, that your ground ought always to be fairer than the *Face* you take, for it is eaſy to darken a light colour, but difficult to lighten a deep one; for in limning you muſt never heighten, but work them down to their juſt colour.

Having prepar'd your ground colour, lay it on with a large pencil, as ſmooth, even and free from hairs as poſſible, with a pencil full of colour, rather thin or wateriſh than thick and groſs, and with two or three dawbs of your great pencil lay it on in an inſtant; the nimbler it is laid on the evener the colour will lie.

You ought to cover rather too much than too little of your ground with this *prime*, than you ſhall uſe for the *Face*.

Having done this, take a pretty large pallet of *ivory* or other matter, and before you begin to work, temper certain little heaps of the ſhadows for the *Face*, on the pallet with your finger.

The order of ſhadows for the FACE.

In all your ſhadows mix ſome *white*; for the *red* in the *cheeks*, *lips*, &c. temper *lake*, *red-lead* and a little *white*; for the *blue* as the *veins*, &c. a little *indigo* and *white*; for the fainteſt and weakeſt colour or ſhades, *lake* and *white*, a little *oker* and a little *indigo*; and if you pleaſe a very ſmall quantity of *pink* or *maſticote*; for the deeper ſhadows *white Engliſh oker* and *umber*; for the darkeſt and hardeſt ſhadows uſe *lake* and *pink*, mix'd with *umber*.

Remember this, that you muſt by no means uſe *black* in a *Face*.

Theſe colours for ſhadows being thus prepar'd on your pallet, draw the lines of profile (*i. e.* the outmoſt ſtroke) of a *Face* with *lake* and *white* mingled very faint; by this you may conveniently mend the draught (if falſe) with a deeper mixture of the ſame colour; having drawn the lines exactly and in true proportion (which is the chiefeſt thing of all) in the next place obſerve the deeper and more remarkable ſhadows, and with the ſame faint *crimſon* colour of *lake* and *white*, give ſome ſlight touches and marks ſomewhat roughly of theſe ſhadows, which you are to finiſh afterward.

The order of drawing at the firſt ſitting.

Firſt, you muſt only dead colour the *Face* as the *oil painters* do, and not meddle with the reſt, and this firſt ſitting commonly takes up two hours.

The *dead-colouring* of a *Face* is to be done the rougheſt and boldeſt of all; having drawn your *Face* with *lake* and *white* (as before) you muſt take to the ſaid colour a little *red-lead*, tempering it to the colour of the *cheeks*, *lips*, &c. becauſe you cannot lighten a deep *colour*, without danger of ſpoiling the picture.

The firſt colour to begin the *Face* with, is the *red* of the *cheeks* and *lips*, ſomewhat ſtrongly the bottom of the *chin*, if the perſon be beardleſs; over, under and about the *eyes*, you will perceive a delicate and faint redneſs, and underneath the *eyes* inclining to a purple colour, which in fair and beautiful *Faces* is uſual, and muſt be obſerv'd; the *tip* of the *ear* and the roots of the hair, are commonly of the ſame colour.

All this you muſt do after the manner of *hatching* with faint and gentle ſtrokes, waſhing it all along.

In ſhort, in your *dead colouring* you muſt cover your ground with the aforeſaid *red*, and the ſubſequent ſhadows.

You need not be over curious in your firſt working; but regard a good bold following of nature, rather than ſmooth curioſity; the roughneſs of the colour may be mended at the next ſitting.

The ſecond ſitting.

This commonly requires four or five hours, in which you are to go over the *Face* very curiouſly, obſerving whatever may conduce either to likeneſs or judicious colouring; alſo taking notice of the ſeveral *graces*, *beauties* or *deformities*, as they appear in nature; or elſe in ſmoothneſs of ſhadows or cloſe and ſweet touching the colours.

Having done the *red*, the next are the *faint-blues* about the *balls* and corners of the *eyes*; and the *grey* and *bluiſh* under the *eyes*, the temples, *&c.* which you muſt work from the uppermoſt part of the *Face* almoſt all over, but exceeding ſweet and faint; ſweetening and heightening your ſhadows by degrees; as the *light* falls.

And in going over the *Face* be ſure to mark out the hard ſhadows in the dark ſide of the *Face*, under the *noſe*, *chin*, *eyebrow*, &c. as the lights fall, and ſomewhat ſtrong touches; in thoſe bring up your work together in an equal roundneſs, not giving perfection to any particular part of the *Face*; but viſiting all the parts curiouſly, and in a kind of random manner; by which means you will better perceive the *likeneſs*, *roundneſs*, *poſtures*, *colouring*, or whatever elſe is requiſite to the perfection of your work.

The party being ſet juſt in his former ſeat, you muſt moſt exactly obſerve, and curiouſly delineate with your pencil thoſe ſeveral varieties of nature, which you did rudely trace out before, *working*, drawing and *ſweetening* the ſame colours into one another, to the end, that nothing be left in your work with a hard edge, uneven or a lump together; but alſo ſo ſwept and driven one into another, with the point of ſomewhat a ſharper pencil than that at firſt us'd, that the ſhadows may lie ſoft and ſmooth, being diſpers'd and gently extended into all; and towards the lighter parts of the *Face* like *air* or a *vapoury ſmoak*; but before this, you muſt carefully obſerve all the *ſhadows* and *colours*.

In the next place go over the hair heightening and deepening it, as you ſhall ſee by the *life*, drawing ſome locks looſely over the *ground*, which would otherwiſe ſeem unpleaſant.

To ſhadow *linen* uſe *black*, *white*, a little *yellow* and leſs *blue*; the *black* muſt be deepened with *ivory-black*, with which mix a little *lake* and *indigo* or *litmus-blue*.

The third ſitting.

The third ſitting commonly takes up two or three hours, and is ſpent in cloſing, what was before left imperfect and rough, but principally in giving to every deep ſhadow the ſtrong touches and deepenings, as well in the dark ſhadows in the *Face* as in the *eyes*, *eye-brows*, *hair* and *ears*, and theſe touches are ever the laſt part of this buſineſs, and are never to be done, till all the hair and drapery be finiſh'd; theſe touches if well done add exceedingly to the life.

Having done the *fainter* or *lighter ſhades*, and ſomewhat ſmooth'd and wrought them into *red*, you may go over the *hair*, diſpoſing it into ſuch *forms*, *folds* or *tramels*, as may beſt become the picture.

You muſt at firſt only draw them with colour, as near as you can ſuitable to the life, and after waſh them lightly at the firſt, and then once more peruſe your work, carefully filling up the void, empty and bare places which are uncovered with colour; and at laſt deepen it ſomewhat more ſtrongly than before in the deepeſt ſhady places; ſtill carefully obſerving the life, and after this do your ground, &c. See GROUND.

The *third ſitting*, as has been ſaid, will be wholly taken up in giving the ſtrong touches, and making the obſervations neceſſary for *rounding* the *Face*, which will be better ſeen how to do; after the apparel, hair, and ground are finiſh'd at the *third ſitting*, you muſt curiouſly obſerve whatever may conduce to likeneſs, as *ſcars*, *moles*, &c. *glances* of the *eyes*, *deſcending* and *circumflexions* of the mouth; but never make your deepeſt ſhadows ſo deep as they appear in the *life*.

After you have done your *ground*, lay your linen with a *flat white*, and the *drapery* likewiſe *flat*. See DRAPERY; then go over your *Face* again, endeavouring to reduce each ſhadow to its true perfection; then draw the lines of the *eye-lids*, expreſſing the *red-dark noſtril*, the ſhady entrance into the *ears*, the deepneſs of the *eye-brows*, and thoſe more perſpicuous notes and marks in the *Face* with a pencil ſomewhat more curious and ſharp than before; you may darken your ground as you ſee will be moſt advantageous for the ſetting off the picture.

FADINGNESS is repreſened in painting, by a lady clad in green, her garment all embroider'd with pearl and precious jewels, with a golden crown in one hand, a lighted torch with this motto, *egrediens ut fulgur* in the other, and a noſe-gay of roſes, part of which fall to the ground, fading and diſcolour'd.

The roſe in the morning buds, is fragrant and flouriſhing, and in the evening languiſhes and fades, a true emblem of the frailty of ſublunary things.

FAITH is repreſented in painting, by a woman clothed in white garments, holding in her hand a cup of gold.

WILLIAM FAITHORN, was a diſciple to Mr. *Peak* painter to Prince *Rupert*; after the civil wars broke out, he went into the army, and being taken priſoner in *Baſing*-houſe, and refuſing to take the oaths to *Oliver*, was baniſhed to *France*; where he ſtudied ſeveral years under *Campagne*, a famous painter of that time, and arriv'd to a very great perfection in correctneſs of drawing. He was alſo a great proficient in graving, as likewiſe in painting in miniature, of which there are many inſtances now in *England*; he died in *Black-Fryars* about the beginning of King *William*'s Reign, and there was buried, near ſeventy five years of age.

FAME is painted like a lady with great wings, and ſeeming to proffer a flight, and to mount from the *earth*, and to rove abroad, having her face full of eyes; all over her garments are an infinite number of ears and tongues.

She is alſo repreſented as a lady clad in a thin and light garment, open to the middle thigh, that ſhe might run the faſter; two exceeding large wings; garments embroidered with eyes and ears, and blowing a trumpet.

FAME. It is alſo repreſented by a curious figure of a naked *Mercury*, with a cloth over his left arm, and his rod in his hand holding *Pegaſus* by the bridle, capering as if he would fly away.

Mercury denotes fame, for he was meſſenger to *Jupiter*; as alſo the efficacy of ſpeech and a good voice, that ſpreads and is diffuſed; *Pegaſus* denotes that fame is carried by ſpeech, that ſounds the actions of government.

PAOLO FARINATO, born in the year 1522, ſcholar to *Nicolo Golfino*, liv'd at *Verona* and *Mantua*, excell'd in hiſtory, ſculpture and architecture, died in 1606, aged eighty four years.

FASTING is repreſented in painting, by a man pale and meagre, in a white antique dreſs; he is muzled, his eyes lifted up to heaven, his right arm extended, and in his hand is the fiſh bull-head; on a ſcroul is written *Pauco Veſcor*, a hare under his left arm and he treading upon a gaping crocodile.

His paleneſs demonſtrates the effect of *Faſting*, the white raiment denotes his ſincerity, not only to abſtain from food, but alſo from vice; looking upwards that his mind is not offuſcated with meat; the fiſh lives upon his own moiſture, and eats little as the motto declares; the crocodile voracious and an enemy to faſting, therefore he treads it under foot; the hare intimates vigilance.

FATE is repreſented as a man clad in a fair, long, flaxen robe, looking upwards to two bright ſtars, encompaſs'd with thick clouds, from whence hangs a golden chain.

FAUNS.
SYLVANS.
SATYRS.
} Theſe and fairies were repreſented much in the ſame form as *Pan*, having little ſhort horns growing on their heads, with ſmall ears and ſhort tails.

FEAR. *Pauſanias* ſays, *Fear* was ſhap'd in ſeveral forms by the ancients; ſometimes with the head of a lion, and ſometimes with the deform'd face and body of a woman.

FEAR is an apprehenſion of an evil to come, fore-running the evils with which we are threatened.

But if there be no appearance of obtaining what we deſire; then inſtead of hope comes *Fear* or *Deſpair*. The motion of *Fear* is expreſs'd in *drawing*, &c. by the eye-brow a little rais'd next the noſe; the ball ſparkling in an unquiet motion, and ſituated in the middle of the eye; the mouth open, being drawn back, and more open at the corners, than in the middle, having the under lip more drawn back than the upper; the complexion redder than even in *love* or *deſire*; but not ſo beautiful, inclining to livid, with the lips of the ſame colour and dry.

Fear ſometimes may have motions reſembling thoſe of *terror*, being only caus'd by an *apprehenſion* of loſing ſomething, or that ſome ill ſhould befall us; this paſſion may give motions to the body, which may be repreſented by the ſhoulders preſs'd together,

ther, the arms and hands drawn cloſe to the body; and the other parts gathered together and bended, expreſſing as it were a trembling.

FEBRUARY is drawn in a dark sky colour, carrying in his right hand the character of the ſign of the zodiack, call'd *Piſces.*

F. C. Stands for *Franceſchino Caracci* of *Bologna*, younger brother to *Auguſtin* and *Hannibal.*

FEET. For drawing Feet there is not ſo much difficulty as in that of hands, and in drawing them, you muſt proceed the ſame way that was ſhewed for drawing of hands. See the proportions in the plate.

To foreſhorten feet ſeen forwards, you muſt make the foot aſide with its proportions and meaſures on the inſide of the foot marked A, and from theſe proportions and meaſures marked 1 2 3 4, draw down perpendiculars until you cut the diagonal, and continue thence lines parallel, to make the ſhadowed foot under the place of the foreſhortened foot, and from the ſaid ſhadowed foot, you muſt raiſe perpendiculars unto the place of the ſaid foot to be ſhortened, which there meeting with the level lines that proceed from the firſt foot by interſection of them, there giveth us the ſaid foot geometrically foreſhortened, as appears here repreſented. Herein the toes of the feet are marked A B C D E, and the like is to be obſerved for the foot ſeen by the heel marked B, and alſo for the foot marked with C ſeen on the fore-part; and laſtly, in like ſort for the foot marked with D, are foreſhortened by the ſame rule as the former.

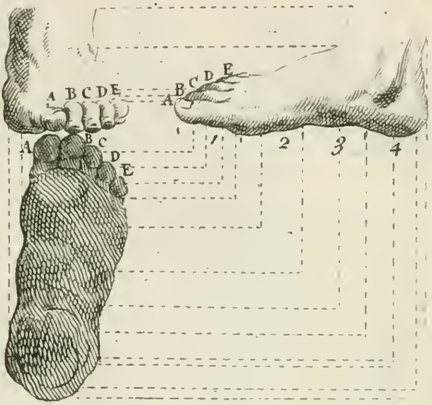
When you can draw hands and feet pretty well, then proceed to arms and legs, and afterwards to whole bodies, in which there will be but little difficulty when you can draw hands and feet.

FELICITY is repreſented as a lady, ſitting on an imperial throne, holding in the one hand a *caduceus* or rod, and in the other hand a *cornucopia.*

FERN. It is a vulgar error that *Fern* and other capillary herbs have no ſeed, for they have it in great quantities, like duſt, and of a dark brown colour on the back-ſide of their leaves: nay, moſſes alſo abound in ſeed, as is evident in an undeſcribed ſort of *chamapeuce*, which is like a *larynx* in the branches of the *Fern*; and betwixt each leaf you'll find an abundance of round and browniſh ſeeds, provided it be cut at the time elſewhere mentioned; for it is very neceſſary to take notice of the times and ſeaſons that all plants and trees ought to be cut in, that they may anſwer the ends deſigned. For extracting of oyls and ſpirits of vegetables in *chymiſtry* for medicinal uſes, they muſt be cut a little before their maturity, whether you uſe the

Plate XVII.

A



C

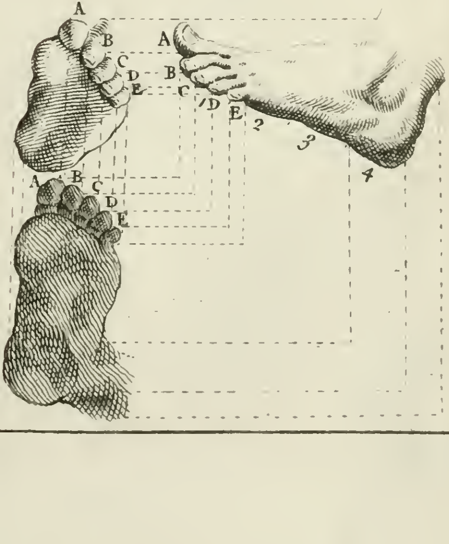


Plate XVII.

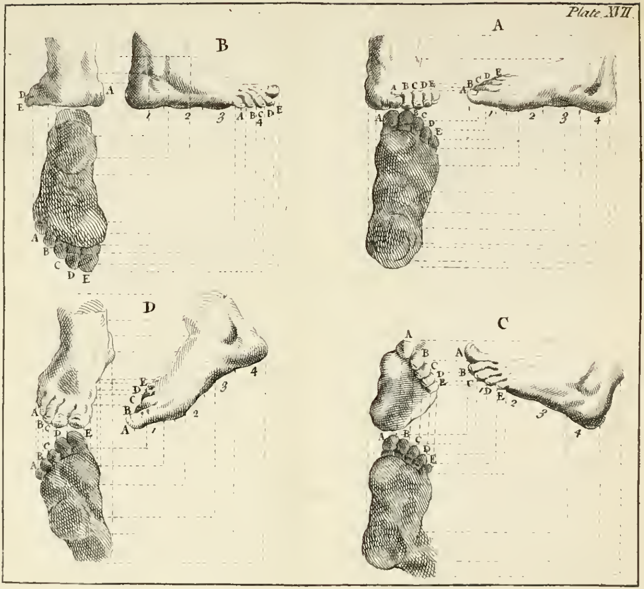

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Plate XVIII.

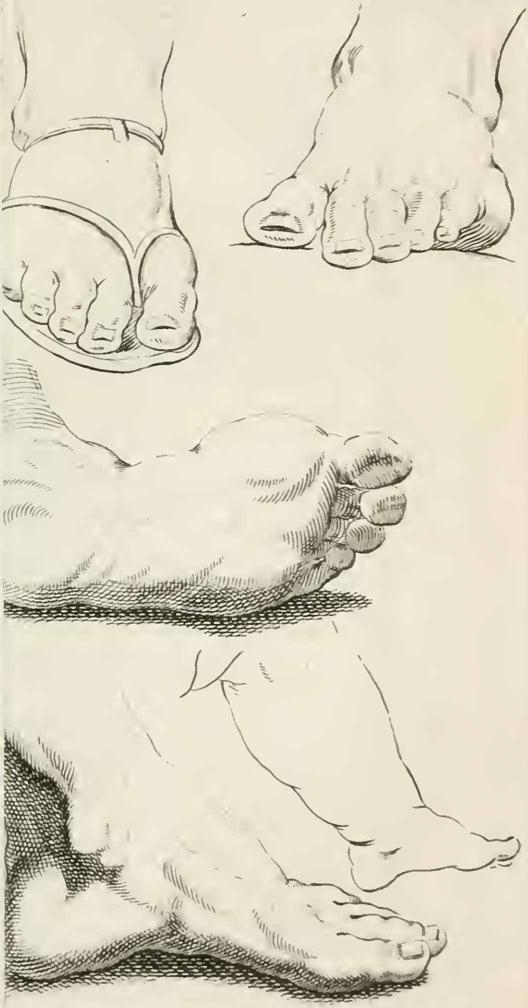
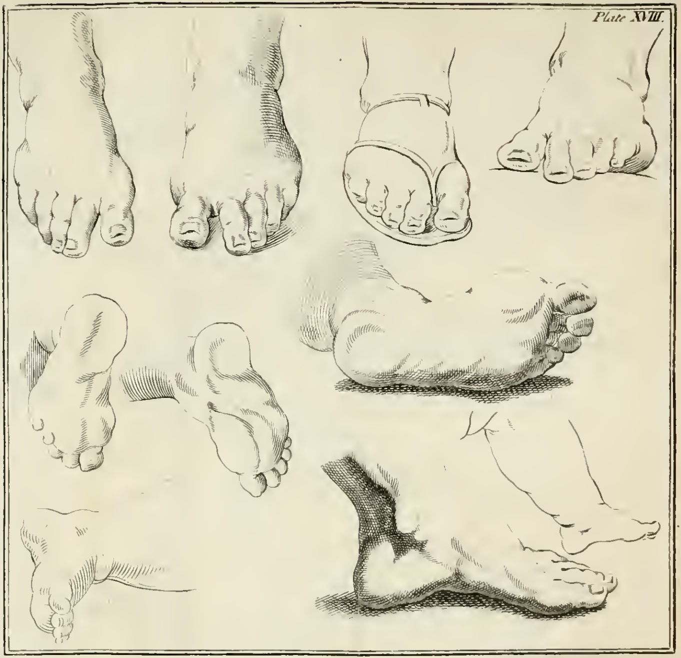


Plate XVIII.



the ſtalks or the leaves; for then they will yield one half more than at another time, as experience teſtifies.

To make FERETTO *of* Spain *for tinging glaſs.*

The name *Feretto* comes from the *Italian* and *Spaniſh*, and is ſo call'd becauſe it is found in iron mines; and commonly *Feretto* of *Spain*, becauſe the moſt part of what was ſold in other parts of *Europe*, and which was the beſt, was found in thoſe mines, and come to us from thence.

There is ſome of it black like iron, and which communicates its colour to the matter, in which it is us'd, which is the reaſon it ought to be choſen; for good *Feretto* is known by its being red, and being beaten, imitates the colour of *cinnabar*, which it always does, when it is pretty well calcin'd.

Pomet in his hiſtory of drugs, ſays, that the *lapis hæmatites* is what we commonly call the *Feretto* of *Spain*; that this mineral is of a reddiſh colour, hard, weighty, and pointed with long and ſharp points; that it is brought from ſeveral places, for as much as there are no iron mines in which it is not found.

That the name *hæmatites* is given it of *haima*, which ſignifies blood, becauſe this ſtone is good for ſtopping of blood; and it is call'd the blood-ſtone, becauſe it is of the colour of blood, and *Feretto* becauſe it is found in iron-mines.

Although *Feretto* be found in mines, yet it may be artificially made much better.

Excellent *Ferretto* us'd to be made antiently in *Cyprus* and at *Memphis*, the metropolis of *Egypt*; but it is not now in uſe, as heretofore.

Neri and *Merret* who have written of the art of *glaſs*, uſe only *copper* or *braſs* for making of *Ferretto*; but neverthleſs true *Ferretto* cannot be made without iron or ſteel, alſo iron and copper are ſomewhat of a like nature, ſince it is eaſy to convert the former into the latter; wherein there is far more vertue for ſeveral operations, than in the natural copper, and it is finer, more pure, and redder.

An ordinary way of making Ferretto *is this.*

Take filings of iron very clean, and ſulphur beat to powder, put them in a crucible, layer over layer, or firſt one layer of ſulphur, then one of filings, and ſo on; beginning and ending with the ſulphur, which is call'd *ſtratification*, or *ſtratum ſuper ſtratum*.

After you have done this, you muſt cover the crucible with another, or with a tile, and lute it cloſe, and ſet it into a furnace with coals round it for ſix hours, increaſing the fire every two hours, that is, for the two firſt hours let the fire or coals be half a foot from the crucible, the two ſecond about a quarter

ter of a foot, and the two laſt let it be covered all over with coals.

Another extraordinary way of making FERRETTO *of* Spain, *which is a great ſecret.*

This way of making *Ferretto* is not common, nor much known; it is of a very wonderful uſe, not only for tinging glaſs, but for ſeveral chymical operations, eſpecially if a ſecond and farther preparation be made of it. But as for that for tinging glaſs only,

Take very fine ſteel, for all the excellency of the work conſiſts in the perfection of that; make it into thin plates, or file it; alſo do the ſame with *copper* or *braſs*, *viz.* make that alſo into thin plates, or take the filings, one part to two of ſteel; put them into a crucible *ſtratum ſuper ſtratum*, lute them, and put it on a gentle fire for eight hours; then take it out, and melt the whole in a wind furnace; then caſt it into a lingot, or in little plates, and the buſineſs is done.

To make uſe of this in glaſs, you muſt calcine theſe plates; then pound them and ſearce them, and keep that powder in a pot cloſe ſtopt for uſe.

Another way of making FERRETTO *of only copper for tinging glaſs.*

This ſecond way of making *Ferretto* is ſomething more troubleſome than the former; but the effects of it in glaſs are far finer.

In this method, you muſt take *vitriol* inſtead of ſulphur, wherewith you ſtatify the thin-plates of copper in the crucible, juſt as in the preceding chapter; then ſet this crucible to calcine in the mouth of a glaſs furnace, which the *Italians* call *occhio* and the *French* the *little working hole*, where let it ſtand for the ſpace of three days.

Then take out the crucible, and add to the *copper* new rows or layers of *vitriol*, ſtratifying it as before; then ſet the crucible in a reverberatory fire in the ſame place as before, which you muſt continue to do for ſix times ſucceſſively one after another, and then you will have a very excellent *Ferretto*, which you are to reduce to powder, and it will tinge glaſs of extraordinary beautiful colours.

The way of making FERRETTO *of only copper for tinging glaſs.*

Neri and *Merret* give the name of *Ferretto* of *Spain* to the following preparations, aſſerting, that it communicates ſeveral very fine colours to glaſs.

The different ways of calcining metals, cauſes different effects.

If the *Ferretto's* before-mentioned be of vaſt uſe in glaſs, and very ſerviceable in *paſtes*, *enamels*, and *glaſs of lead*, by reaſon of the great reſemblance it gives to precious ſtones, this and the following are of no leſs uſe.

Take thin plates of *copper* or *braſs*, cut them into pieces, and put them into a crucible, in the bottom of which you have laid a bed of *ſulphur* pulveriz'd; then a layer of *copper*; then another of *ſulphur*, which you muſt thus continue *ſtratum ſuper ſtratum* till the crucible is full.

Then cover the crucible with another, or with a tile, and lute it well, and dry it, and put it into a furnace among hot coals in a good briſk fire for the ſpace of two hours; then take out the crucible, let it cool, and you will find the copper or braſs calcin'd, which will break and crumble between your fingers like dry earth of a blackiſh colour.

This is to be pounded in a mortar to a fine powder, ſearc'd, and kept in a veſſel well cloſ'd for uſe.

CIRO FERRI, born in the year 1628, ſcholar of *Peter Cartona*, liv'd at *Rome*, excell'd in hiſtory and architecture, died in the year 1690, aged ſixty-two.

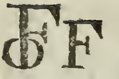
FESTOON, a *garland*, or ornament of flowers, fruits and leaves intermix'd; antiently much us'd at the gates of temples, where feaſts or ſolemn rejoicings were held; or at any other places where marks of publick joy and gayety were deſired, as at triumphal arches, tournaments, &c.

DOMENICO FETTI, born in 1589, ſcholar of *Ludovico Civoli*, and ſtudied *Julio Romano*; liv'd at *Rome*, *Mantua*, and *Venice*, excell'd in hiſtory, died in the year 1666, aged ſeventy ix years.

FEVER is repreſented in painting by a young woman meagre and pale, having black hair, hot vapour iſſuing out of her nouth, a lion at her feet, very melancholy, holding one hand pon her heart, and in the other the chain of a ſlave inſcrib'd, MEMBRA CUNCTA FATISCUNT.

She is young, becauſe young perſons are moſt ſubject to Feers; her mouth open ſignifies the included heat wants vent; he lion denotes a Fever, becauſe he is always in one; the chain hews, that it affects all the parts by the arteries diffuſed thro' he members.

LE FEVRE DE VENISE, was a *French* hiſtory painter, who came into *England* in the reign of King *Charles* II. He was better at deſigning, as appears by his work, than for paintng; he had a particular excellence in ſtaining marble, which he id ſeveral times for Prince *Rupert*. He died in *London* about orty-five years ago, and lies buried in St. *Martin*'s Church.


ODOARDO FIALETTI *Fecit*. A painter and engraver of *Bologna*, us'd this mark.

FIDELITY is repreſented in painting by a woman cloathed in white, with a ſeal in one hand, a key in the other, and a white dog by her.

The key and ſeal denote fidelity, becauſe they lock up and conceal ſecrets; the dog is the moſt faithful animal in the world, and beloved by men.

FIELDS, HILLS, *and* MOUNTAINS.

1. Fields that lie near muſt be done with a ſingular good *green*, the which muſt always be fainteſt, according as they fall off to a farther diſtance; heightening them with *maſticote* or a light *green*, and ſhadowing with *ſap-green*, but not too much.

2. Thoſe which lie far off are to be laid with a *French berry yellow*, made of a greeniſh *blue*, ſhaded with oker.

3. And in fields, hills, and dales (whether near or far off) there are many roads, paſſages, and ways, which muſt be laid either fainter or ſtronger, according to their diſtance and ſituation.

4. Thoſe mountains which are next in ſight are to be laid with a fair green, and ſhaded with *ſap green*; ſometimes with *brown* oker and *French* berries, to diſtinguiſh them from ſuch as are far off.

5. Such as lie farther off are to be done with *green*, *blue*, and *maſticote*, and ſhaded with *blue*, *green*, and *verdegreaſe*.

6. Such as lie yet farther muſt be laid with ſome ſtrong *blue*, white, and *Bergh-green*, and ſhaded with ſtrong *blue*.

7. Thoſe which lie yet farther off muſt be done with ſome ſtrong *blue*, and *white*, and ſhaded with blue only.

8. Thoſe that lie at ſtill a greater diſtance are to be laid only with *white*, and ſhaded with a faint *bice*.

9. Thoſe that lie yet farther off are done with *bice* and *white*, and ſhaded with *bice*.

FIERCENESS is repreſented in painting by a young woman ſeeming to be beſides herſelf, breathing out threats, laying her left hand upon a tiger's head, as if ſhe was a going to ſtrike, holding an oaken cudgel in her right hand in a threatning manner.

She is repreſented young, and therefore undaunted; her right hand upon the tiger denotes fierceneſs and cruelty; the oaken club ſignifies the hardheartedneſs of ſavage men, *Duro robore nati*.

FIGURE [*in painting*, &c.] ſignifies the lines and colours which form the repreſentation of a man or other animal; thus it is ſaid of a figure, this figure is lame, and there are fifty figures in this piece.

But in a more immediate and peculiar manner figure is underſtood of human perſonages; thus a piece of painting is ſaid to be full of *Figures*, when there are a great many repreſentations of men; and a landſcape wherein is nothing but trees, plants, mountains, *&c.* is ſaid to be without *Figures.*

And ſo likewiſe in *ſculpture*, we ſay *Figures* of marble, braſs, plaiſter, ſtuck, *&c.* but chiefly of human repreſentations, and but rarely, if ever, to other things. Thus we call a man on horſeback an *equeſtrian Figure.*

But *Daviler* obſerves, that thoſe human figures that are repreſented ſitting, or kneeling, or laid all along, as thoſe on monuments, *&c.* and rivers perſonify'd are more properly call'd *Figures* than ſtatues.

FIGURES. *To colour* NAKED FIGURES, *as*

1. *Women* and *children.* Mix the beſt *flake white-lead* and a little good lake, and (if you pleaſe) a little vermilion; but take care that the mixture be neither too red nor too pale, but as agreeably as poſſibly can be to the life it ſelf.

2. When this is dry, touch the lips, cheeks, chin, fingers and toes with thin lake, and then heighten with white mixt with a little *lake* or *vermilion.*

3. If you would cover them ſomewhat browniſh, mix with your *carnation* a little brown *oker*; and ſhade it with *red oker* and coal-black with a little lake.

4. For *old women*, uſe *white*, *vermilion*, and *brown oker*; and where the luſtre ought to be, give it with *vermilion* mixt with a little lake.

5. Give the ſhade with *red-oker* and *lake*, or with *wood-ſoot* or *lamp-black*; and heighten with *white*, mixt with a ſmall quantity of *vermilion.*

6. Paint *dead children* and *young women* with *brown oker*, *white* and ſome *vermilion*; and ſhadow with the *ſoot* of wood.

7. Colour *dead old women* with brown oker mixt with a little white; ſhade firſt with a thin wood *ſoot*, and afterwards with a ſtronger.

8. Paint *young men* with *ceruſs*, *vermilion*, and *lake*, making it a little browner than for young women, giving them luſtre with vermilion and lake, and ſhadowing with *lamp black* and brown *oker*, and heightening with ceruſs and *vermilion.*

9. Limn *old men* with *vermilion*, brown *oker* and *white*; ſhade with *ſoot* and *lamp-black*; heighten with *vermilion*, brown *oker* and *white*, and give a luſtre with lake or vermilion.

10. Colour *dead men* with brown oker, white and a little *vermilion*, with diſcretion; ſhade with ſoot or *lamp black*, mixt with a little *ceruſs.*

11. Colour *devils*, *ſatyrs*, or the like with brown *oker*, mixt with a little *white* and *red*; and make this mixture, ſome part of it white, and ſome part of it browner, ſhading it ſtrongly with *ſoot*, according to diſcretion.

To dye a deep FILLEMOT.

For twenty-eight pounds of wool, take ten ounces of *galls*, and a pound of *fucette* or *virette wood*, half a pound of *madder*, and two ounces of *gum gutta*; boil the dye, and ſtir the ware in it, till the dye hath penetrated it ſufficiently.

If you would have it brighter, then take but ſix ounces of *galls*, and ſix ounces of *madder*; and add a quarter of a pound of *verdegreaſe*.

Or elſe take half a pound of *fucette wood*, a quarter of a pound of *galls*, and one ounce of *madder*, and one ounce of *vitriol*.

To dye a FILLEMOT.

Firſt, let the ware be dyed *yellow*; then paſs it through the hot *black* dye, and when it is cool, rinſe it, always remembring that the lighter the *yellow*, the lighter will be the *Fillemot*; then having ſet fair water over the fire, put in half an ounce of *braſile* wood; let it boil for a quarter of an our, and then paſs the ware through it.

To dye SILK *a* FILLEMOT.

Firſt dye the ſilk in the laſt-mentioned yellow; then for every pound of ſilk, take a quarter of a pound of blue *Provence* wood; boil it in a bag as uſual for half an hour, in the quantity of a pail of water; take the bag out, and let the ſuds ſtand to cool, till you can juſt bear your hand in it; then lay the yellow ſilk to ſoak in it for a full hour; then take it out, and boil a ſufficient quantity of powdered ſoot in half a pail of water for half an hour, and afterwards put in the ſilk. When it is taken out, let it be rinſed in a good ſtrong lye of wood aſhes, and after that in river water, and then hang it out to dry.

To dye a light FILLEMOT.

Take a quarter of a pound of galls beaten ſmall; boil them an hour and a half in a pail of water; then put in a quarter of a pound of vitriol, a handful of ſoot beaten ſmall, and ſo put the yellow ſilks into it, till it grows dark enough; then rinſe it and dry it.

Crimſon FILLEMOT.

Fill a well clean'd kettle half full of water, and for every pound of ſilk, take half a pound of yellow wood, which boil in a bag in the water for ſome time; then add one pound of galls, and fill up the kettle with ſtale, or old gall water; then take the ſilks off the poles (they having been firſt boil'd, alumed and rinſed) put them into the kettle, and boil them for an hour; then ſoak them in the liquor a whole night, and in the morning wring them out, rinſe, and beat them; and afterwards brown them a little, till they become ſufficiently deep.

A ſlight FILLEMOT.

For every pound of ſilk, take one pound of Fucet-wood, and half an ounce of pot aſhes; boil them together, and in order to render the dye deep enough, brown it with a little black at pleaſure; when the ſilk is deep enough dy'd, rinſe and dry it.

To make a room ſeem all on FIRE.

Take rectified ſpirits of wine, and diſſolve *camphire* in it; evaporate this in a very cloſe chamber, where no air can get in, and he that firſt ſhall enter the chamber with a lighted candle, will be fill'd with amazement; for the chamber will ſeem full of fire, and very ſubtil; but it will be of very ſhort continuance.

This done in a cloſe cup-board or preſs, will be much more perſpicuous and viſible.

An excellent invention to make a pleaſant COAL FIRE.

Take of the beſt *Newcaſtle*-coals pounded ſmall three parts; loam one part; mix them well together into a maſs with water; make them up into balls, and dry them well.

This fire is durable, ſweet, and not offenſive, by reaſon of the ſmoke or cynders, as other coal fires are; but burns as well in a chamber as charcoal it ſelf.

To dye SILK *of a* FIRE *colour.*

Alum your ſilk (ſee the article ALUM, *&c.* in the article CRIMSON) then tie up half a pound of *Braſile* in a bag to each pound of ſilk, and lay it in liquor for half an hour; then take it out, and put in an ounce of beaten *turmerick*; let the dye diſſolve, and when it is cold, take out the ſilk, and put the bag in again with ſome lye; boil it again, and then take out the bag, and put in the ſilk, leaving it in till it is cold; then rinſe it, and dry it.

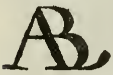
To dye a FLAME *colour.*

It being firſt dyed yellow, boil two ounces of *fuſtel-wood*, and an ounce of pot-aſhes, for every pound of woollen-ſtuffs, for half an hour; ſtir it very well, and then put in the ſtuffs; work it till the colour is to your mind, then rinſe it out.

FIRE and FLAMES [in miniature] are coloured, the lights with *maſticote* and *orpiment*; and for the ſhades, *vermilion* and *carmine.*

To dye SILK *a* FLAME *colour.*

Firſt boil, rinſe, beat and dry the ſilk, and for every pound, take two ounces of *Orleans*, diſſolve it in warm water, and wave the ſilk to and fro in it till it is juſt ready to boil, which it muſt not be ſuffered to do; then rinſe and beat the ſilk; and afterwards to every pound of ſilk, take ſix pounds of wild ſaffron, prepar'd as directed in the *Spaniſh* fleſh colour, or in carnation, four ounces and a half of pot aſhes, two quarterns and a half of lime juice; all which muſt be prepar'd as in the pearl and flame colour.



ALBERT FLAMEN in certain plates of birds, beaſts, and fiſhes, made this mark.

Alexander Badiali, a painter and engraver of *Bologna*; and *Another Boſs*, a native of *France*, alſo uſed this mark.

FLATTERY is repreſented in painting by a woman in an affected wanton habit, playing upon a flute; a buck at her feet faſt aſleep, with a bee-hive by her ſide.

The buck denotes flattery, becauſe he is ſo charmed with muſick, that he lets himſelf be taken; the bees are a true emblem of it, carrying honey in their mouth, and a ſecret ſting in their tails.

F. L. D. *Ciatres exc.* the mark of a dealer in prints.

To dye woollen ſtuffs, &c. *a* FLESH *colour.*

Firſt boil the ſtuff or cloth for two hours in a liquor made with a pound of *alum*, a pound of calcin'd *tartar*, four ounces of *ceruſs*, and three ounces and a half of *arſenick*; then take it out, leaving the ſuds over the fire; and the next morning prepare a liquor made with two pounds of good leather ſhreds, a quarter of a pound of *Orleans*, two ounces of *turmerick*, and an ounce and half of *aqua fortis.*

Another.

When you have a mind to dye ſilk, linen, or cottons with *Braſile* wood, take two ounces of *Braſile* for a pair of cotton ſtockings, and an ounce of galls, and alſo two ounces of *Braſile*, and an ounce of *alum*; and paſs them through each dye twice, till the dye becomes as clear as water, and they will be of a beautiful fleſh colour, even to admiration.

Another.

Boil the cloth for an hour in a liquor made with three pounds and a half of *alum*, four ounces of *ceruſs*, and three ounces of *arſenick*; pour off the water, and rinſe the ſtuff in running water, and then make a liquor of eight pounds of *madder*, and two ounces of *ſal armoniack*; let them lie a night to diſſolve; then boil them a little, adding one ounce of *pot-aſhes*; then pour ſome of this upon the ſtuff in the other kettle; and as often as it is poured on, ſo often you dye, ſo that you may leave off when it is light dyed, or deepen it as you pleaſe; and if you would have it very deep, mix with the *pot-aſhes* an ounce and an half of *borax*, and that will alſo give it a beautiful luſtre.

Another FLESH *colour.*

For every pound of woollen, boil in a little water one ounce of *tartar*, and half a quarter of an ounce of *ſtarch*; skim the liquor, then put in a quarter of an ounce of *cochineal*, a quarter of an ounce of *ſtarch*, an ounce of *aqua fortis*, with a quarter of an ounce of *Engliſh tin*, and an ounce of rain water.

Firſt make the water boil with the *tartar* and *ſtarch*, and afterwards put in the reſt of the ingredients; which boil together, and put in the ware, and boil it in the liquor for an hour, and the work is done.

Another.

Boil in fair water two ounces of *white wine tartar*, *ſtarch flour* one ounce, of juice of *lemons* as much, *cream of tartar* half an ounce, and as much *turmerick* as will lie upon the point of a knife. When theſe have boil'd, put in an ounce of *cochineal*, and a ſmall time after two ounces of *aqua fortis*, in which two drams of tin hath been diſſolv'd, and boil the ware an hour in this liquor.

A paler FLESH COLOUR.

This dye muſt be made juſt as the laſt, except that there muſt be but half the ſame quantity of ingredients, and that without any galls.

A Spaniſh FLESH *colour.*

For every pound of ware take two ounces of *tartar*, a quarter of an ounce of *cochineal*, a quarter of an ounce of *ſtarch*, to which add half an ounce, when the former has been a little while in the ſuds.

Then having diſſolved two ounces of filings of *tin* in three ounces of *aqua fortis* in the ſun-ſhine, put the *cochineal* into the liquor by degrees; and when it boils, put in the *aqua fortis*, and a little after that, put in the goods to be dyed, adding a quarter of an ounce of *cream of tartar*, or the moſt ſubtile *tartar*, half an ounce of *ſtarch*, half an ounce of *lemon juice*, and half an ounce of *cochineal*; boil for a quarter of an hour, or as you ſee occaſion.

FLESH *colour, to dye.*

To dye an incarnate or Fleſh colour in grain.

Take ſtale liquor made with fair water and wheat bran, or ſour tap-wort, being very clear, a ſufficient quantity, alum bruis'd two pounds and a half, red tartar bruiſed ſmall one pound; boil all together, and enter twenty yards of broad cloth; boil and handle it well for three hours; after which cool your cloth, and waſh it well; then take freſh bran liquor (made of a peck of bran) the clear liquor a ſufficient quantity, grains of kermes four ounces dried in a pewter diſh before the fire, and made into a fine powder, red argol in powder four ounces; mix all theſe three things together, and make them boil; enter your cloth, and handle it, boiling it three quarters of an hour ſtrongly, and keeping the cloth under the liquor; then cool and waſh it well.

Another incarnate colour in grain.

Take ſmall beer, *alum* twenty ounces, *red tartar* eight ounces; melt or diſſolve; then enter twenty yards of ſtuff or cloth, *&c.* and boil it two hours and a half; then cool; let it lie in water twenty-four hours; after which waſh it well. Take fair water and ſmall beer, of each equal parts, a ſufficient quantity, *grains* in fine powder an ounce; infuſe them all night, putting in alſo a little *wheat flour*, about an ounce; then make it ready to boil; enter your cloth.

Another incarnate, or Fleſh colour.

Firſt boil your cloth well in a good *alum* water; take it out, hang it up dropping, and let it dry. Take clear *bran* liquor a ſufficient quantity, *cochineal* in fine powder one ounce, *tartar* half an ounce; mix and make almoſt a boiling heat, letting it take as little air as may be; then enter your cloth, and handle it as quick over as may be for about half an hour; after which, take it out, waſh it well in cold water, and hang it up to dry.

Another incarnate or Fleſh colour, called a raſberry red.

Take *bran* liquor a ſufficient quantity, *alum* three pounds; boil for three hours; then add *madder* four pounds, *Braſile* ground four ounces, alum one ounce, freſh *bran* liquor a ſufficient quantity; boil, and then enter twenty yards of camblet ſtuff, but not boiling; keep it in two hours, take it out, and waſh it well.

To dye linen or fuſtain of a FLESH *colour.*

For every pound of linen, put two ounces of baſtard or wild *ſaffron* in a bag, and lay it all night in the quantity of a pail of water to diſſolve; throw away this water, and take another pail of water; and having taken the *ſaffron* out of the bag, rub it well betwixt your hands, and wring it clean out of the water; filter the liquor that none of the *ſaffron* be loſt, and then throw it away; repeat this operation as long as the *ſaffron* leaves any yellow tincture, and then wring it out dry with your hands.

Then take a little lye made with good *beech aſhes*, heat it, and put it to your thus prepar'd *ſaffron*, letting it lye and ſteep for five or ſix hours; then wring it out, and that none may remain, filter the lye through a hair ſieve; then throw away the *ſaffron*, and add to the lye an equal quantity of beer *vinegar*; ſtir it about very well, and put in your pound of linen, letting it lie in the liquor for three or four hours, and then rinſe it clean out, and it will be of a very good crimſon *Fleſh* colour; but you muſt take care to ſtir the linen often about, to prevent its being flak'd and unequally dyed.

To dye woollen, ſilk, worſted, or yarn, of a FLESH *colour.*

Firſt prepare two pails full of ſharp lye from a handful of *beech*-aſhes twice boil'd; throw a pound of *pot-aſhes* into one pail, and heat the lye in a braſs-kettle; and when the aſhes are diſſolv'd, ſtir the liquor very well; briſk up the fire, and then put in a pound of flocks or ſhreds of red dyed cloth; hang the kettle over the fire; let it boil for ſome time, and ſtir it about with a ſtick; then fill it up with the remaining lye, ſcum it clear, and as it boils away for three hours, fill it up with ſtale urine; then paſs a thread of yarn through it, and draw it thro' your finger to examine whether there are any hairs hanging to it, and if they do, put in a quarter of an ounce of *turmerick* powdered; ſtir it well about, and try with the thread of yarn again, whether it takes a red as you would have it.

If you would have the goods of a beautiful *orange* colour, then pour half the dye into another vat, and put the goods into it, having been before dyed yellow with broom or dyers *yellow weed*; and in the remaining part of the dye you may put the whole goods (which muſt not be alumed) and then cover it very cloſe, that no ſteam may evaporate before it be cold.

Then put about two pails full of water into a tub, and in it rinſe both the colours very well; dry them, preſs them, and rinſe them again in ſpring water.

If you would have the ware of a very beautiful *Fleſh colour*, hang the kettle (which muſt be of braſs) again over the fire, boil the dye to ſuds, and put in the ware, leaving it there till it is cold; then rinſe it in the ſame water, which you have before, but take a ſpecial care that you do not mingle the orange and *Fleſh colour* together.

If you would have a lighter orange colour, hang the dye again over the fire, and put in the ware that has been dyed yellow, and let it lie till it becomes cold; then rinſe it, as the *Fleſh colour* before.

If you would have a lighter *Fleſh colour*, then boil the dye again to ſuds, and put in the white ware, as before, and rinſe it out; and ſo, if you would dye a light gold colour, &c. do it as before, and take the water wherein you have rinſed your former ware, and boil or heat it, and then put in the quantity of a pigeon's egg of *alum*; after which, put in the ware that is dyed either *blue* or *yellow*, and let it lie in it till it is cold, and then rinſe it out.

To dye SILK FLESH *colour or* INCARNADINE.

For every pound of ſilk, put in a quarter of a pound of *Braſil*; boil it, ſtrain it through a ſieve, and pour freſh cold water upon it. While it is warm, put in the ſilk, leaving it in till it hath drawn all the ſtrength out of the dye; then rinſe and dry it.

To dye SILK *the beautiful* Spaniſh FLESH *colour or* CARNATION.

Firſt prepare and alum your ſilk as for *crimſon*, and for every pound of ſilk, take four pounds of *wild ſaffron*, which put into a thick back; throw it into ſeveral waters, and work it ſo long, till the water comes from it clear; then take the ſaffron out of the bag, ſqueeze it, and rub it with your hands till it is dry, putting it into another veſſel; afterwards for every pound of ſilk take a quarter of a pound of pot aſhes, and rub them well into the *ſaffron* in a clean veſſel; and after that, if it be neceſſary, it may be rubb'd again.

When all this has been done, divide the ſaffron into two parts, and take a bag ſo thick that the pot-aſhes cannot get thro', when it is tied up; put one part of the ſaffron into this bag, and pour clear water upon it in the kettle, till the ſtrength of the ſaffron is boil'd out; then for every pound of ſilk, take half a pint of lime juice, and divide that alſo into two parts, and to each part of ſaffron, add one part of lime juice; then take the dry ſilk, and ſtir it up and down in the kettle, in which the looſe part of the ſaffron is, for the ſpace of an hour; then let it be very well wrung and paſs'd thro' the kettle where the bag is, and for an hour continually ſtirred; then let it be wrung out and dry'd in a dark place, and not in a clear light, and it will be of the beautiful colour deſired.

To make FLOCK CLOTH *hangings.*

Spread coarſe canvaſs upon an even floor or table, and having flocks or ſhreds of woollen ground as ſmall as duſt, and the cloth being ſiz'd over with good ſtrong ſize while it is wet, ſift the flocks through a fine ſieve, which when you have done, run a roller of wood or iron over the piece to preſs them down cloſe, and ſo ſuffer them to dry in the ſhade, leſt the ſun or fire parch them, or make them crack; and when they are dry, bruſh them over lightly with alum water, and ſo draw your deſign with black and red-lead, charcoal black, or any other colour, and it will at a diſtance look like tapeſtry, and be very laſting in a room where no great fires are made.

FLORA, the Goddeſs of flowers, is repreſented in a black mantle, FRANCIS FLORIS, born in the year 1520, ſcholar of *Lambert Lombard*, and ſtudied *Michael Angelo*; liv'd at *Antwerp* and in *Italy*, excell'd in hiſtory, died in the year 1570, aged fifty years.

FLOWERS. It is moſt delightful to paint flowers, not only becauſe of their luſtre, but alſo becauſe they take up but little time, and require hardly any time to do them; it is all pleaſure and no trouble. You ſpoil a face if you make one eye a little higher than the other, if you make a ſmall noſe or a large mouth, and ſo on of the other features. But the fear of theſe proportions never troubles the mind when you are about *Flowers*, for except they be quite out of the way indeed, you ſpoil nothing, and accordingly moſt of the Quality who apply themſelves to painting, concern themſelves with nothing but *Flowers*. You muſt however learn to copy a little exactly; and for this branch of miniature, as well as for the reſt, I refer to dame nature as your only guide; work then after natural flowers, and ſearch for their tints and various colours upon your pallet. A little practice will eaſily bring you to be expert in this; and in order to pave the way for you at firſt, I will ſhew you, continuing my deſign, how to paint ſome of them; it is not always you can have natural *Flowers*, which ſee under their proper articles, and you may be often obliged to copy from prints, where you ſee nothing but graving.

The colouring of FLOWERS.

1. *The corn Flower.* Let this be done with *blue* mixt with ſome *white*; ſhadow with *indigo*, and alſo with *blue* and *white*.

2. *The marygold* is to be done with *yellow orpiment* and *minium*; ſhadow with *vermilion* and *lake* mixt with *minium*, and heightened with *white* and *maſticote*.

3. *The clove gilliflower or* July *Flower*. Do this with fine *lake* mixt with *white*; ſhade it with *brown lake*, and heighten it with *lake* mixt with *white*; the ſpeckling or ſpotting of it is done with *lake*. Thoſe which are lighter with a lighter red upon a pure *white*; thoſe like flames with *vermilion* and *lake*, which ſhade with a ſtronger *lake*; and ſpeckle the *white* with *lake* and *vermilion* to reſemble the life.

Lay the green ſtalks or branches and leaves with *Bergh-green*, and ſhade with *ſap-green*.

4. *The white roſe* is to be done with *flake-white*; ſhade with *white* and *black* (but the chief ſhadows with a ſtronger *black*) and heighten with *white*.

The little *thrums* (which ſome call *ſeeds*) in the middle of the roſe, lay them with *maſticote*, and ſhadow with *minium*, and heighten with *white*.

9. *The damask roſe.* Do it over with *lake* mixt with white; ſhadow with the ſame, mixt with thin *lake*, and heighten with *white.*

Let the *green leaves* be laid over with *verdegreaſe* mixt with ſome *French berry-green*; ſhade with *verdegreaſe* mixt with *ſap-green*, and make the ſtalks ſomewhat browner with *brown oker.*

6. *Red roſe.* Lay this over with fine *lake* mixt with *white*; ſhade it with *brown lake*, and heighten it with *lake* mixt with *white.*

7. *To colour a tulip.* Draw it firſt with *black-lead* upon a white ground; then ſhade it a little as for a white flower with thin *Indian ink*, or with *green*, *yellow ink*, or with *black-lead* ground with thick *gum-water.*

Then lay on the colours reſembling nature, which being dry, ſhade with a higher colour, and then farther, ſhadow it according to the nature of the *Flower.*

So that being finiſh'd, it may be like *flame*, *red*, *blue lake*, *purple*, *ſpotted*, or otherwiſe, in imitation of the life.

FOLIAGE, a cluſter or aſſemblage of flowers, leaves, branches, &c. It is particularly us'd for the repreſentations of ſuch flowers, leaves, branches, rinds, &c. whether natural or artificial, us'd as in inrichments on capitals, freezes, pediments, &c.

FOLIATING } Looking glaſs plates. The plates having
SILVERING } been poliſh'd, are next to be foliated or ſilver'd, which is perform'd after the following manner:

A thin blotting paper is ſpread on a table, and ſprinkled with fine chalk; and then a fine *lamina* or leaf of tin, called *foil*, is laid over the paper; upon this *mercury* is poured, which is equally to be diſtributed over the leaf with a hare's foot or cotton. Over the leaf is laid a clean paper, and over that the glaſs plate.

The glaſs plate is preſs'd down with the right hand, and the paper is drawn gently out with the left; which being done, the plate is covered with a thicker paper, and loaden with a greater weight, that the ſuperfluous *mercury* may be driven out, and the *tin* adhere more cloſely to the glaſs.

When it is dried, the weight is removed, and the looking-glaſs is complete.

Some add an ounce of *mercury* to half an ounce of *marcaſite* melted by the fire; and leſt the *mercury* ſhould evaporate in ſmoak, pour it into cold water, and when cold, ſqueeze it thro' a cloth or leather.

Some alſo add a quarter of an ounce of *lead* and *tin* to the *marcaſite*, that the glaſs may dry the ſooner.

FOLLY is repreſented in painting by a perſon at man's eſtate, in a long black garment, laughing, riding upon a hobby horſe, holding in one hand a whirligig of paſte-board, and plays the fool with children, who make him twirl it by the wind.

Folly is only acting contrary to due decorum and the common cuſtom of men, delighting in childiſh toys and things of little moment.

FORCE of ELOQUENCE is repreſented in painting by a woman in a decent grave habit, holding *Mercury*'s rod in her hand; a lion under her feet.

This demonſtrates, that force and ſtrength give place to the eloquence of thoſe whoſe tongues are well hung; for we perceive the unruly mob, though threatning deſtruction, are preſently appeaſed, and lay down their arms ſo ſoon as they hear a grave eloquent perſon demonſtrate the danger of the riot, and their boiſterous huzza's are all on a ſudden huſhed into ſilence, and they tamely ſubmit to his dictates.

FORCE of JUSTICE is repreſented in painting by a lady in royal apparel, crowned, about to ſit down upon the back of a lion, and ſeems to lay her hand upon her ſword, which denotes juſtice, as the lion does ſtrength; ſo that the ſtrength of the latter ſubmits to the former, *i. e.* juſtice.

FORCE of LOVE is repreſented in painting by a naked ſtripling, reſembling *Cupid* ſmiling, with wings on his ſhoulders, holding a dolphin in one hand, and a garland of flowers in the other, to ſhew the power of love both by ſea and land through the univerſe.

The empire of *Cupid* is ſometimes imitated by his ſitting in a chariot, drawn by two lions, with his hand held up towards heaven, from whence fall arrows and flames that give place to none, for *Jupiter* is not exempt from them.

FORCE of VIRTUE is repreſented in painting by a very handſome young man, called *Bellerophon*, mounted upon *Pegaſus*, who with a ſpear kills a chimera which allegorically ſignifies a certain multiform variety of vices. The etymology of his name denotes a killer of vice.

FORE-SHORTENING in drawing, ſignifies the drawing a thing as it appears to the eye, and not every part to its full length and proportion; but to make thoſe parts ſhorter whoſe full length and bigneſs is hid from our ſight.

As if you would draw an horſe ſtanding fore-right, looking, as it were, full in your face, you muſt of neceſſity *Fore-ſhorten* his hinder parts, becauſe his ſides and flanks do not appear to you in their full latitude.

In like manner, if you were to draw a ſhip ſituated fore-right, there can appear to you only her fore-part, the reſt being hid from your ſight, and therefore muſt not be expreſs'd.

Wherefore you muſt obſerve this rule always, rather to obſerve the viſible proportion of things than their proper and natural by meaſure; for the eye and underſtanding together, being directed by the art of proſpective ought to be the guide and meaſure to judge of drawing and painting.

Obſerve therefore in all *Fore-ſhortenings*, that there muſt be a proportion obſerv'd, according to the judgment of the eye, that what limbs do appear may agree in proportion, as well as *Fore-ſhortening.*

Nothing muſt be expreſs'd in drawing, but what will accord with nature in every point, as if you were to draw a man turning his head over his ſhoulder, you muſt not make him turn or wind more than nature will permit, nor muſt any other action be forced beyond the bounds of nature, nor muſt any thing come ſhort of it; but though nature is not to be ſtrain'd beyond its bounds, yet it ſhould be expreſs'd to the higheſt pitch.

So if you were to expreſs a man in any violent action, as fighting, either ſtriking or endeavouring to avoid the ſtroke; or as in running or wreſtling or leaping, or any other violent action, you muſt not expreſs any of theſe in a poſture that cannot agree with the motion of nature, and that a man cannot imitate with his body, and the like as to all things elſe; for nature muſt be the parent and pattern of all kinds of draughts.

Of drawing a FORERIGHT *naked figure.*

To draw a good naked figure very well is one of the moſt difficult performances in painting, becauſe it cannot be done well without underſtanding anatomy.

In doing this, firſt ſtrike a line perpendicular as long as you deſign the figure, and then divide that line into ſo many diviſions or parts, as you deſign the proportion; the common or ordinary proportion is eight meaſures or *heads*, whereof the *head* is reckoned one of the eight. See the articles HEADS, FACES, PROPORTIONS, MEASURES, *&c.*

Always begin with the *head* firſt, becauſe the body is always proportioned to the head; then divide the head into four equal parts, the firſt for the *hair*; the ſecond for the *forehead*; the third for the *noſe*; the fourth for the *mouth* and *chin.*

But a painter is not bound exactly to this rule when he draws to the life; becauſe theſe rules were intended for no other uſe than to create the *idea* of ſuch and ſuch proportions firſt in our brain, and to prevent drawing in an extravagant and prepoſterous proportion. For faces differ one from another, ſome have long noſes, others ſhort, ſome an high forehead, others a low one;

the diſtance betwixt the noſe and chin is longer in ſome than in others.

Then having sketch'd out the line and fram'd the head, proceed downwards, and one head's length from the chin you draw the breaſts, the third reacheth to the navel, the fourth to the privities, the fifth to the middle of the thigh, the ſixth to the lower part of the knee, the ſeventh to the ſmall of the leg, and the eighth to the ſole of the foot.

Obſerve to draw the ſhoulders at the extremities or broadeſt part to be two heads and an half broad, the breadth of the hips to be but the diſtance of two heads, the arm to be ſix meaſures of the head long; but if you reckon the breaſts in, they make eight, when the arms are extended out.

Alſo take notice that when the arm hangs down, it reaches within a ſpan of the knee.

In proceeding downwards, take care to place all the muſcles in their right and proper places according to nature, as they are obſerv'd in the life; for there are no certain rules for the placing them.

Therefore it will be very advantageous to draw very much after the life, and after good prints of anatomy and ſtatues, and anatomies of plaiſter of *Paris*, which is the only way to arrive at the drawing a naked figure well.

FORTUNE is repreſented in painting by a naked woman, having an enſign or veil over-ſhadowing her, ſtanding upon a globe or ball.

Lactantius ſays, that fortune is a vain, idle and ſenſeleſs name, ſhewing forth man's weakneſs in attributing any thing thereto; which *Tully* confirms, when he ſays, that this name of fortune was firſt brought in to cover the ignorance of man.

Pauſanias ſays, that her moſt ancient form was that which *Bupalus* made in *Greece* in ſhape of a woman, upon whoſe head was a round ball, and in one of her hands a *cornucopia*; ſhe is call'd the blind goddeſs and partial lady, by reaſon of the beſtowing of her unconſtant and mutable favours.

Macrobius ſays, ſhe was firſt ſet forth with wings on her ſhoulders (to ſhew that ſhe was always at hand among men) and had by her ſide the rudder of a ſhip, to ſhew that ſhe rules and commands; ſhe herſelf being plac'd upon a wheel, holding in her right-hand a golden ball, and in the other a whip, ſhewing where ſhe ſmil'd wealth and honour; and where ſhe frown'd croſſes and miſery ſhould follow.

In *Ægypt* ſhe was depicted like a lady turning a great glaſs wheel, on whoſe top were many men playing; others climbing up, and others having attain'd it precipitating themſelves and falling down again.

GOOD FORTUNE is repreſented in painting, by a woman about to ſit down, leaning her right arm upon a wheel, inſtead of the celeſtial globe; and holding a *cornucopia* in her left-hand.

As the wheel is ſometimes up and ſometimes down, ſo fortune changes. The *cornucopia* denotes her being a diſpoſer of the riches and good things of this world; and the wheel being continually in motion, ſhews fortune is fickle and ever and anon changes, ſometimes abaſing one and exalting another.

F. P. ſignifies *Francis Primaticcio* or *Franciſco Parmagiano*, who ſometimes put an F only in his wooden cuts, engraven with three tools.

F. P. I. V. *Bonaſius.* Theſe letters are found in a *Madonna* of *Franceſco Primaticcio*, engrav'd by *Julio Romano.*

BAPTISTA FRANCE, *a Venetian*, ſcholar of *Michael Angelo*, liv'd at *Rome*, *Florence* and *Venice*, excell'd in hiſtory painting, died in the year 1561.

FOUNDERY is the art of melting and caſting all ſorts of metals, particularly braſs, iron, *&c.*

The FOUNDERY of ſmall works or the manner of caſting in ſand.

The ſand us'd by *Founders* in caſting of braſs, copper, *&c.* is of a yellowiſh colour, pretty ſoft and greaſy; but having been once us'd becomes black, by reaſon of the charcoal duſt us'd in the moulds.

Every time this ſand is us'd, it is wrought and tew'd ſeveral times over in a board about a foot ſquare, plac'd over a kind of trunk or box into which it may fall from off the board.

This tewing is perform'd with a roller or cylinder, about two foot in length, and two inches in diameter, and a ſort of knife made of the blade of a ſword; with theſe two inſtruments they alternatively roll and cut the ſand, and at length turn it down into the box underneath.

Then they take a wooden board or table of a length and breadth proportionable to the quantity of things to be caſt; round which they put a frame or ledge, and thus make a ſort of mould.

This mould is fill'd with the ſand before prepar'd, and a little moiſtened.

When this has been done, they take models or patterns (either of wood or metal) of the things they would caſt, and theſe they apply on the mould preſſing them down into the ſand ſo as to leave their form indented.

Along the middle of the mould is laid half a little cylinder of braſs, which is to be the maſter jet or canal for running the metal; being ſo diſpos'd as to touch the ledge at one ſide, and only to reach to the laſt pattern on the other.

From this are plac'd ſeveral leſſer jets or branches reaching to each pattern, whereby the metal is convey'd through the whole frame.

Having thus finiſh'd the firſt frame, they turn it upſide down to take out the patterns from the ſand, in order to which they firſt looſen them a little all round, with a ſmall cutting inſtrument.

The counter-part or other half of the mould is done after the ſame manner, with the ſame patterns in a mould exactly like the former, excepting that it has pins, that entring the holes anſwer to them in the other caſe, that when the two are join'd together, the two cavities of the pattern fall exactly on each other.

The frame having been thus moulded, is carried to the melter or founder; who after enlarging the principal jet of the canal of the counter-part with a kind of knife, and adding the croſs jets, or canals to the ſeveral patterns to both, and ſprinkling them over with mill-duſt, ſets them to dry in a furnace.

When both parts of the mould are ſufficiently dry'd, they are both join'd together by the means of pins; and to prevent their ſtarting or ſlipping aſide by the force of the metal which is to be pour'd in flaming hot, through a hole contriv'd at the maſter jet, they are lock'd in a kind of preſs, either with ſcrews, or with wedges, if the mould be too big.

The moulds having been thus ſet into the preſs, are rang'd near the furnace to be in readineſs to receive the metal, as it comes out of the crucible.

While they are thus preparing the moulds, the metal is put in fuſion in an earthen crucible, about ten inches high and four in diameter.

The furnace in which the metal is ſet for fuſion, is much like a ſmith's forge, having like that a chimney to carry off the ſmoke, a pair of bellows to blow up the fire, and a maſſive or hearth where the fire is made which chiefly diſtinguiſhes the furnace from the forge.

In the middle of it is a ſquare cavity, ten or twelve inches wide, which goes to the very bottom. It is divided into two by an iron-grate, the upper partition ſerves to hold the crucible and the fewel, and the lower to receive the aſhes.

The fewel is to be dry wood, which when it is well lighted the crucible full of metal is ſet into the middle of it, and covered with an earthen cover; and a tile is laid over part of the aperture or cavity of the furnace, to increaſe the force of the fire beſide blowing it up with the bellows.

When the metal is brought to a *fluor*, i. e. to be melted, they fill the crucible with pieces of braſs, beaten in a mortar putting them in with a kind of iron ladle, having a long ſhank at the end, form'd into a kind of hollow cylinder, out of which the ball is dropt.

The metal being all melted, the crucible is taken out of the fire by a pair of iron tongs (the feet of which are bent the better to embrace the top of the crucible) to the mould, into which he pours it, by the hole anſwering to the maſter jet of each mould.

And thus goes on from one to another, till his crucible is emptied, or there is not matter enough left for another mould.

Then caſting cold water on the moulds, the frames are taken out of the preſſes, and the caſt-works out of the ſand which is work'd up again for another caſting.

Then they cut off the jets, and deliver the work to other perſons, who finiſh it.

The CASTING *of ſtatues*, &c.

The art of caſting ſtatues in braſs is very ancient; inſomuch that its origin was ſo remote and obſcure, that *Pliny*, an author admirably skill'd in diſcovering the inventors of other arts, could not diſcover it.

All that we can learn for certain is, that it was practis'd in its perfection firſt among the *Greeks*, and afterwards among the *Romans*; and that the number of ſtatues conſecrated to the Gods and hero's, ſurpaſs'd all belief.

This taſte for ſtatues was carried to ſuch a pitch, that it became a proverb, that in *Rome* the people of braſs were more numerous than the *Roman* people.

Among us, the caſting of ſtatues was but little known or practis'd before the ſeventeenth century.

The method of CASTING *ſtatues or figures.*

There are three things chiefly requir'd in caſting of ſtatues, buſts, *baſſo relievo's*, vaſes and other works of ſculpture.

The *mould* or *core* (ſo call'd of *cœur* the heart in *French*, as being the heart or middle of the ſtatue) is a rude, lumpiſh figure, a little reſembling the ſtatue deſign'd to be caſt.

It is rais'd on an iron-grate ſtrong enough to bear it, and is ſtrengthened on the inſide with ſeveral bars or ribs of iron.

It may be made indifferently of two ſorts of matter, as the work-man pleaſes, *viz.* potter's earth mixt up with horſe dung and hair; or of plaiſter of *Paris* mixt with fine brick-duſt.

The uſe of theſe moulds in ſtatues is to leſſen their weight, and ſave the expence of metal. In bells it takes up all the inſide, and it preſerves the vacant ſpace where the clapper is hung.

In great guns it forms the whole barrel from the mouth to the breech, and in mortars the barrel and chamber.

The *wax* is a repreſentation of the ſtatue deſign'd in wax.

If it be a piece of ſculpture, the wax muſt be all of the ſculptor's own hand, who uſually faſhions it on the mould itſelf.

It may be wrought apart in cavities moulded or form'd on a model, and afterwards diſpos'd and arrang'd on the ribs of iron over the grate as before; filling the vacant ſpace in the middle with liquid plaiſter and brick-duſt; by which means the mould or core is form'd in proportion as the ſculptor carries on the wax.

When the wax (which is to be the intended thickneſs of the metal) is finiſh'd, there are little waxen tubes fitted perpendicularly to it, from top to bottom, to ſerve both as jets for the conveyance of the metal to all parts of the work, and as vent holes to give paſſage to the air, which would otherwiſe occaſion great diſorder, when the hot metal came to encompaſs it

The weight of the metal, that the figure will take up, is adjuſted by the weight of the wax; ten pounds of metal being allow'd to one pound of wax.

The work now wants nothing but its ſhell, with which it is to be cover'd, and this is a kind of cruſt or coat laid over the wax, and which being of a ſoft matter and even at firſt liquid, eaſily takes and preſerves the impreſſion of every part of it, which it afterwards communicates to the metal; upon its taking the place of the wax between the ſhell and the mould.

The matter of this outward ſhell or cover is varied, according as the different lays or *ſtrata* are apply'd.

The firſt is a compoſition of putty and old crucibles well ground and ſifted, and work'd up with water to the conſiſtence of a colour fit for painting.

Accordingly it is apply'd with a pencil, laying it ſeven or eight times over; letting it dry betwixt whiles.

For the ſecond coating they lay horſes dung, and natural earth to the former compoſition, and the third impreſſion is only horſes dung and earth.

Laſtly, the ſhell is finiſh'd by laying on ſeveral more coats or impreſſions of this laſt matter, rendred very thick with the hand.

The ſhell being thus finiſh'd is ſtrengthened and ſecur'd by ſeveral bands or girts of iron wound round it at half a foot diſtance from each other, and faſtened at the bottom to the grate under the ſtatue, and at top to a circle of iron where they all terminate.

Here it is to obſerv'd, that if the ſtatue be too big, that it will not be eaſy to move the mould when thus provided, it muſt be wrought upon the ſpot where it is to be caſt.

This may be perform'd two ways; the firſt is by digging a ſquare hole in the ground, much larger than the mould that is to be made in it; and the walls of it muſt be lin'd with free-ſtone or brick.

At the bottom muſt be a hole of the ſame materials with a kind of furnace, whoſe aperture muſt be outward.

In this a fire muſt be lighted to dry the mould and afterwards to melt the max.

Over this furnace is plac'd the grate, and on this the mould, &c. ſame as is above ſhewn.

In the laſt place, at one of the edges of the ſquare pit another large furnace is to be made for melting the metal, as hereafter mentioned.

In the other method, it is ſufficient to work the mould above ground; but with the ſame precaution of a furnace and a grate underneath.

When this has been finiſh'd, four walls are to be run up, and by the ſide thereof a maſſive made for a melting furnace.

As for the reſt the method is the ſame in both.

The mould being finiſh'd and inclos'd between four walls, whether under ground or above it; a moderate fire muſt be lighted under it, and the hole cover'd with planks, that the wax may melt gently down, and run out at pipes contriv'd for that purpoſe at the foot of the mould, which are afterwards to be very exactly clos'd with earth, as ſoon as all the wax is carried off.

When this is done, the hole is fill'd up with bricks thrown in at random, and the fire in the furnace augmented, till ſuch time as both the bricks and the mould become red hot; which uſually happens in twenty four hours time.

Then the fire being extinguiſh'd, and every thing cold again, the bricks are taken out, and their place is fill'd with earth moiſtened and a little beaten to the top of the mould, in order to render it the more firm and ſteady.

Matters being carried on thus far, nothing now remains to be done, but to melt the metal and run it into the mould.

This is done by the furnace above, which is made in the manner of an oven, with three openings; one to put in the wood, another for a vent, and a third for the metal to run out at.

This laſt aperture or opening, which is kept very cloſe, all the while the metal is melting, a little tube or canal is laid, by which the melted metal is convey'd into a large earthen baſon over the mould, into the bottom of which all the big branches of the jets, which are to carry the metal into all the parts of the mould, are inſerted.

Theſe jets are all terminated or ſtopt with a kind of plugs which are kept cloſe, that upon the opening of the furnace, the braſs which guſhes out like a torrent of fire, may not enter any of them, till the baſon be full enough of matter to enter them all at once.

Upon which occaſion they pull out the plugs, which are long iron rods with a head at one end, capable of filling the whole diameter of each tube.

The hole of the furnace is opened with a long piece of iron fitted at the end of each pole; and the mould filled in an inſtant.

The work being now finiſh'd, at leaſt ſo much as belongs to the *caſting*; what remains is the buſineſs of the ſculptor or carver, who taking the figure out of the mould and earth with which it is encompaſs'd, ſaws off the jets with which it appears cover'd over, and repairs it with inſtruments proper to his art, as chiſſels, gravers, puncheons and the like.

FRAUD is repreſented in painting, by a woman with two faces, one young and the other old; feet like eagle's talons, a tail like a ſcorpion; two hearts in her right hand, and a mask in her left.

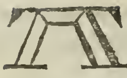
The two faces denote fraud and deceit, ever pretending well, the two hearts the two appearances; the mask intimates that fraud makes things appear otherwiſe than they are, and the baſe deſigns and diſcord, they foment, like birds of prey to rob men of their goods and honour.

JOHN FREEMAN was a good hiſtory painter in the reign of King *Charles* II, he was thought to have been poiſoned in the *Weſt Indies*, but he returned to *England*, and died here; yet his genius was ſo much impaired by that attempt on his life, that his latter works fail'd of their uſual perfection; he was look'd upon as a rival to Mr. *Fuller*; inſomuch that his brother Colonel *Freeman* offered to lay a wager of 100 *l.* that he would draw a figure with that maſter; which challenge, but for what reaſon I know not, was never accepted.

Mr. *Freeman* was in his drawings, eſpecially in the academy, moſt extraordinary, and equal to any of our modern maſters. He was in his latter days ſcene painter to the play-houſe in *Covent-Garden*, where many of his works are ſtill to be ſeen.

FREE-WILL is repreſented by a man of juvenile years, cloath'd in a royal habit of divers colours, crown'd, and a ſcepter in his hand, on the top of which is the *Greek* letter Υ.

He is young becauſe diſcretion is requiſite to attain. The habit, crown and ſcepter determine his abſolute power; the divers colours, his not being determined; and that he can act by divers means. The Letter Υ declares the two ways of man's life, virtue and vice as the Υ is divided at the top.



AGNES FREJI, wife of *Albert Durer*, us'd this mark on ſeveral little plates, engrav'd by her, repreſenting our Saviour's myſteries, or elſe ſome ſcholar of his.

FRESCO. A method of painting or rather plaſtering on walls to endure the weather, and repreſenting birds, beaſts, herbs, fruits, *&c.* in relief.

It is perform'd on freſh plaſter, or on a wall laid with mortar, not yet dry, and with water colours.

This ſort of painting has a great advantage by its incorporating with the moiſture, and drying along with it, it is rendred extreme durable, and never fails or falls, but along with it.

As to the method of this painting, it is as follows.

The plaſter muſt be made of well waſh'd lime, mixt with fine powder of old rubbiſh ſtones; the lime muſt be ſo often waſh'd, till all its ſalt is abſtracted, and all the work muſt be done in clear dry weather; or it may be mixt well with well burnt flints.

And in order to render the plaſter more durable, they ſtrike into the joints of the brick or ſtone walls, ſtumps of horſe nails at about ſix inches diſtance from each other, to prevent the plaſter from peeling off.

With this plaſter the wall is firſt to be plaſtered a good thickneſs, and left ſome time to dry; the deſign and colours being firſt ready prepar'd.

This painting is chiefly perform'd on walls and vaults, newly plaſtered with lime and ſand; but plaſter muſt only be laid in proportion as the painting goes on, no more being to be done at once than the painter can diſpatch in a day, while it is moiſt.

Before the painting is begun, there is uſually a cartoon or deſign made of paper to be calk'd and transferr'd to the wall, about half an hour after the plaſter has been laid on.

The colour being prepar'd and mingled, the wall is to be plaſtered over again the ſecond time about the thickneſs of a half crown; but only ſo much as you intend preſently to work upon, and while it is wet, you muſt work the colours therein, which will mix and incorporate with the plaſter, ſo as never to waſh out.

The painting muſt be, for the work to come out in all its beauty, wrought quick, and with a free hand, for there can be no mending or alteration after the firſt painting, and therefore make your colour high enough at firſt; yet you may deepen, but not eaſily lighten.

Nor muſt they ever be retouch'd dry, with colours mixt up with the white of an egg or ſize or gum, as ſome workmen do, by reaſon that ſuch colours grow blackiſh; nor do any preſerve themſelves, but ſuch as were laid on haſtily at firſt.

In this painting all the compound and artificial colours, and almoſt all the minerals are ſet aſide, and ſcarce any thing us'd but earths; which are capable of preſerving their colour, defending it from the burning of the lime, and reſiſting its ſalt, which *Vitruvius* calls its bitterneſs.

The colours us'd are white made of lime ſlak'd long ago, and white marble duſt, oker both red and yellow, violet, red-verditer, *lapis lazuli*, black, *Spaniſh* brown, *Spaniſh* white, &c. all which are only ground and work'd up with *lime-water*, *milk* or *whey*, and moſt of them grow brighter and brighter as the *Freſco* dries.

The bruſhes and pencils for this work, muſt be long and ſoft, or elſe they will rake and raze the painting.

The colours muſt be full and flowing from the bruſh; the deſign perfect in the image or paper copy, for in this work you cannot alter or add upon any colour.

This ſort of painting has a great advantage, by its incorporating with the mortar, and drying along with it, it is rendred extremely durable, and never fails nor falls, but along with it. The ancients painted on ſtuck, and it is worthy obſervation in *Vitruvius*, what infinite care they took in making the incruſtation or plaſtering of their buildings, to render them durable and beautiful.

Though the modern painters find a plaſter made of lime and ſand, preferable to *ſtuck*, both becauſe it does not dry too faſt, and as being a little browniſh, it is fitter to lay colours on, than a ground ſo white as ſtuck.

This kind of painting was the ancient *Grecian* way of painting, and afterwards was much us'd by the *Romans*.

Plutarch informs us, that *Aratas* the great commander under *Ptolemy* King of *Egypt* (in a compliment to the Emperor's affections that way) forbore to ſack a wealthy city, merely for the excellency of the *Freſco* painting upon the walls of the houſes.

There have been ſeveral whole towns of this work in *Germany*, excellently well done; but now ruin'd by the wars.

At *Rome* there are three chambers (in the *Popes* palace) of *Freſco* done by *Raphael Urbin*, and *Julio Romano* (his diſciple) who finiſh'd his maſter's work; which is yet call'd *Raphael*'s deſign.

There are other places done by *Andrea del Sexto* or *Sarto* and *Michael Angelo*, and ſome other artiſts.

There is alſo an excellent *Freſco* work at *Fontainbleau* in *France*. It is the continued travels of *Ulyſſes* in ſixty pieces, done by *Bolleme Martin Rouſe*, a *Florentine* and others.

The colours uſed in Freſco.

White is made of old lime and white marble duſt, near as much of the one as the other; ſometimes a fourth part of the white marble duſt will do, which depends on the quality of the lime, and is found but only in practice.

If there be too much marble the *white* will grow blackiſh.

Ooker, a browniſh-red is a natural earth.

Oker yellow is a natural earth, which turns red by burning.

Yellow-dark or *ruth oker* is alſo a natural and ſlimy earth, and is taken up in the water in iron-mines; when it is calcin'd, it takes a fine colour.

Yellow of Naples, is a kind of ſlime which gathers about ſulphur mines, and though it is made uſe of in *Freſco*, it is not of ſo good a colour, as that which is made of *earth* or *yellow oker* with *white*.

Red-oker is a natural earth found in *England*, and ſerves inſtead of *lake*.

The ancients had a colour which is now loſt, it was as lively as *lake*; for in *Titus*'s baths at *Rome*, there is a chamber, where there ſtill remains in the ceiling ſome ornamental works in ſtuck, inrich'd with bands of gold azure and a red, which ſeem to be *lake*.

Earth-green of *Verona* in *Lombardy*, is a natural earth hard and dark.

Earth-green, another that is lighter.

Lapis lazuli is a very hard ſtone, and difficult to be prepar'd; 'tis calcin'd in the fire, then pounded very ſmall in a mortar, mixt with *wax* and *roſin*, of which a ſort of paſte is made, which is moulded and waſh'd in clean water, what comes out firſt is beſt; and its beauty diminiſhes till it is reduce'd to a gravel like lees. This colour ſubſiſts and keeps better than any other. It is to be tempered on the pallet, when us'd with oil and not ground. But this being very dear may be ſpared in *Freſco*, where *amel* has the ſame effect, eſpecially in ceilings.

Amel is a blue colour, has a little body; 'tis us'd in great landſcapes; it muſt be calcinated in an iron-box, to make it the more brown and beautiful.

Earth of Cologne is a ruſſet-black, apt to turn red.

There is another earth of *Germany*, which is a natural earth with a bluiſh caſt, like the black of a coal; printers make uſe of this black.

There is another *black* us'd, made of the lees of burnt wine, which the *Italians* call *feſcia da Botta.*

Theſe are the beſt colours for painting in *Freſco.*

All thoſe that are natural earths are good; they are ground and tempered with water.

Before the painter ſets to work, he prepares all the chief teints, and puts them into ſeparate earthen pots.

It muſt be obſerv'd, that all the colours brighten as they grow dry, except *red-varniſh* which the *Italians* call *pavonazzo*; the *browniſh red-oker*, *ruth-oker*, and the *blacks*, particularly thoſe that paſs through the fire.

The painters generally try their colours on a dry ſmooth tile; for the tile preſently imbibing all that is moiſt in them, and drying them, they ſee by it, what effect they will have when us'd.

CHARLES ALPHONSE *de Freſnoy*, born in the year 1611, ſcholar of *Perrier* and *Vouet*, liv'd at *Rome*, excell'd in hiſtory, died in the year 1665, aged fifty four.

FRIGHT is repreſented in painting, by a man with a frightful aſpect, in armour, with a drawn ſword in his right hand, in a threatning poſture, in his left he holds *Meduſa*'s head.

His aſpect and arms inſpire fear, and his threats terrify; *Meduſa*'s head denote fears.

FRIT } is the matter or ingredient, whereof glaſs is to
FRITT } be made, calcin'd or bak'd in a furnace. See GLASS.

Frit is a ſalt drawn from the aſhes of the plant *kali*, or from fern, which mix'd with ſand or flints and bak'd together, make an opake maſs.

Pliny deſcribes flint to be a fine ſand from the *Volturnian* ſea, mix'd with three times the quantity of nitre, which being melted makes a maſs call'd *ammonitrum*, which reboil'd makes pure glaſs.

Neri obſerves, that *Frit* is only the calx of the materials that make glaſs; which though they might be melted, and glaſs made without thus calcining them, yet it would take up much more time.

This calcining or making of *Frit*, ſerves for mixing and incorporating the metals together, and evaporating all the ſuperfluous humidity.

There are three kinds of *Frits*; the *firſt* is *cryſtal Frit* or that for cryſtal metal, made with ſalt of *polverine* and ſand.

The *ſecond* and ordinary *Frit* is made of the bare aſhes of *polverine* or *barillia*, without extracting the ſalt from them. This makes the ordinary white or cryſtal metal.

The *third* is *Frit* for green glaſſes, made of common aſhes without any preparation. This *laſt Frit* will require ten or twelve hours baking.

The materials us'd in each are to be reduc'd into a fine powder, waſh'd and ſearced; then equally mix'd, and frequently ſtirr'd together in the melting pot. See GLASS.

The way to make Frit *for cryſtal.*

The name *Frit* is generally known in all glaſs-houſes, for the firſt preparation of matter to make glaſs and cryſtal, which is made in the firſt oven call'd calcar.

To ſeek the etymology of it, will not be neceſſary to our preſent purpoſe, it is apply'd to the drying the matters in this furnace, where they are reduc'd into great and little lumps.

We think it ſufficient to ſay, that to make fine and perfect cryſtal, there muſt be had matter fuſile and capable of being rendred white and tranſparent in the fire.

We have already told you, that ſalt is the firſt and principal matter for this work, here we will add, that the next, and which gives glaſs its conſiſtence, body or hardneſs, is ſand or ſome ſorts of ſtones, juſt as copper gives conſiſtence to *Roman*, *Dantzick* and *Hungarian vitriol* and others; which would otherwiſe run into water in moiſt places.

Whence it comes to paſs, that the cleareſt and moſt tranſparent glaſs, made of the fineſt and moſt pure ſalt, will diſſolve in earth or in moiſt or cool places, if there be more ſalt in proportion than *ſand* or *tarſo*, by a ſeparation natural to thoſe two matters; it is for this reaſon, that ſome aſſert, that putting poiſon extracted out of minerals into *Venice* glaſs, the great cold of it will diſſolve the glaſs.

All this depends upon the compoſition of the *Frit*, wherein the quantities of *ſalt* and *tarſo* ought to be rightly proportioned to one another, to make the glaſs more or leſs fixed.

Several authors have given the name *tarſo* to all matters, which give conſiſtence to glaſs when they are calcin'd.

Agricola in his twelfth book ſays, that white *ſtones* when melted, are the beſt ingredients in this art; for this reaſon, they ought rather to be employed than any others for making cryſtal. *Pliny* ſays, that authors affirm, that the *ſtones* in *India* glaſs is made ſo excellently tranſparent, that no other is comparable to it.

The *Venetians*, who make glaſs in the *Iſle of Muran* as well as thoſe in *Italy*, make uſe of a white *flint*, which they have out of the river *Ticinus*; where there is abundance of them, as alſo in the river *Arnus*, both above and below *Florence*, and in other places.

They uſe alſo a rich *ſand* full of *ſalt*, which they find in *Tuſcany* and in the *Vale of Arnus*, as alſo a ſort of hard white *marble*, which is found in *Tuſcany* known to every body; it grows at the foot of the little mountains *Piſa* or *Sarvavezza*, *Maſſa* or *Carrara*, that ought to be choſen, which is very white; which has no black veins, nor yellow or red ſtains in it.

Of all of theſe materials may be made very white *tarſo*, and alſo very fine glaſs and cryſtal.

Ferrandus Imperatus, l. 24. c. 16. makes mention of *Quocoli*, and thus ſpeaks of it. The *glaſs-ſtone* is like in appearance to white *marble*, being ſomewhat tranſparent, but hard as a flint, whence being ſtruck, it will ſparkle and put into the fire turns not to lime; that it is of a light green like the ſerpentine ſtone, having veins like *Venice talk*, that being caſt into a fire, it ceaſes to be tranſparent, and becomes light and more white, and more light, and at length is converted into glaſs.

It is certain, that all white and tranſparent *ſtones*, ſuch as will not become *lime*, are very fit for making glaſs; that all fire *ſtones*, and thoſe which ſtrike fire when they are calcin'd and reduc'd to an impalpable powder, and ſifted through a very fine ſieve, make an incomparable pure and fine cryſtal; and all the art conſiſts in reducing the *tarſo* to ſuch fine impalpable powder, but the great trouble in doing it, has made the glaſs men give it over.

They make uſe now a-days, much more of *ſand* than of flints, becauſe there is little or no expence in its preparation, which only conſiſts in waſhing it clean, and afterwards drying it and ſifting it before you uſe it, and that is all; this is the firſt matter or ingredient for making glaſs; but flints being found better and more fine, they afterwards made uſe of them, nothing but the parſimony and covetouſneſs of the times had brought the other in uſe again; becauſe glaſſes made of that may be afforded cheaper.

Cryſtal requires a ſoft and white *ſand*, common glaſs one more rough, hard and grating like a file; *ſands* differ very much from one another, for ſome will melt quickly, and mixing with the *ſalt* immediately be converted into glaſs; others again will endure a ſtrong fire, but in general there is no *ſand*, but what may be made into glaſs.

To make *Frit*, you muſt have two hundred pounds of *tarſo*, prepared as we have ſhewn, or fine *ſand*, and mix therewith about one hundred and thirty pounds of *ſalt*, alſo prepared after the manner elſewhere mentioned. See TARSO.

Care muſt be taken to mix the two materials well together, then to put them into the furnace to be calcin'd, after it has been well heated to make the *Frit*.

During the firſt hour, the fire muſt be moderate, and the *Frit* continually ſtirred with an iron-rake, that the materials may the better incorporate; then the fire muſt be increaſed to a very ſtrong heat for the ſpace of five hours, continuing always ſtirring the *Frit* with the rake, which is very neceſſary to the preparation of it.

After the ſpace of five hours the *Frit* (having had ſufficient fire) will be made and reduc'd to lumps about the bigneſs of a filbert, which (if it be enough) in breaking will be light and white without any yellow; for if you find any of that, you muſt put it into the furnace again, till it loſe that yellow colour which it will infallibly do.

By how much the more the materials are ſtirred and calcin'd in the furnace, they will be ſo much the more refin'd, and melt more eaſily in the pots; after this you take it out of the furnace, and let it cool; then you lay it on boards in a dry place, otherwiſe the moiſture would cauſe the *ſalt* to melt into water, and only the *tarſo* would remain behind, which of itſelf would never be made into glaſs.

After this you cover it well for fear of duſt, for you muſt take a great deal of care and caution to have a fine cryſtal.

The *Frit* thus made, ought to be as white as ſnow, but during the time it is making, you muſt try whether the quantities are well proportioned or not, which muſt be done by putting ſome of the *Frit* into a crucible, and afterwards on a clean piece of glaſs; where it may be ſeen whether it be well made by its joining together, and being clear, if it be too hard or too ſoft, you muſt increaſe or diminiſh the quantity of *ſalt* in it; which thoſe experienced in the art, know very well how to do at firſt ſight; this being well prepared and kept in a dry place, will laſt three or four months; nay, it will grow better and more fit to unite together ſpeedily.

The way of making ordinary FRIT *of* polverine rochetta *or* barillia *of* Spain.

FRIT is nothing but a calcination of the materials mixt together which make *glaſs*.

Although thoſe materials would melt and be converted into *glaſs*, without this calcination, yet uſe and reaſon have dictated this way, ſince otherwiſe it would take up a great deal both of time and labour.

To avoid which this way of calcining the materials in furnaces was found out, which being rightly made, and the doſes in the compoſition of it juſtly obſerv'd, it may immediately be put into the pot to be clarified before it is wrought.

Frit made of *polverine* makes ordinary white-glaſs, and that which is made of *rochetta* of the *Levant*, makes a very fair cryſtal;

ſtal; and that which is made of *barillia* of *Spain*, makes a glaſs not ſo white and fair, being commonly ſomewhat unctuous, which makes the glaſs incline to an azure or blueiſh colour.

To one hundred pounds of *barillia*, you may put eighty five or ninety pounds of fine *tarſo* (See TARSO) and you muſt regulate that doſe according to the goodneſs and fatneſs of the *Barillia*, which experience will teach you.

Then you muſt mix ſix or eight pounds of good *ſand* with the doſe, after having well waſh'd, dry'd and ſifted it, and of the whole you make a *Frit*, which will produce a very white and fair glaſs.

This *Frit* being calcin'd in the *furnace*, you muſt take it out hot, and throw upon it three or four pails of cold water; and then put it in a moiſt and cold place, after which you muſt from time to time ſprinkle it with a ſmall *lee* for the ſpace of three months, which will render it as hard as ſtone. So that you cannot break it without a hammer; this frit will melt eaſily, and makes a very white glaſs almoſt like cryſtal, but eaſier to work.

The *lees*, which communicate to it their ſalt, work this effect, and augment the *Frit*; if the *lees* ſhould fall ſhort, or you have none, you may water it with common water, which although it is not ſo ſtrong as the *lee*, yet it is uſeful.

To make this ſmall *lee*, you muſt uſe the earthy parts or *fæces*, which ſettle in your earthen pots; when you make ſtrong *lees*, as follows.

You muſt fill the ſame veſſels with common water a little heated, and let it ſtand therein, long enough to extract the *ſalt* that remains; afterwards you take out that water gently with an iron-ladle, without troubling the *fæces*, and filter it, to clarify it, and afterwards let it ſtand ſome time to ſettle, and then keep it for the uſe aboveſaid.

Theſe *lees* will be ſtill pretty ſharp and full of *ſalt*, communicate it to the *Frit* in watering it, and by this means none will be loſt.

It is true in our modern times, wherein workmen rather ſeek to abbreviate than embelliſh their work, there are but very few that take the pains to water their *Frit* after this manner. Yet as that *Frit* is the fineſt, moſt fruitful and moſt eaſy to melt, we thought it worth while to propoſe it.

FRUITS, ROOTS, *&c. to colour.*

Apples. Colour with a thin *maſticote* mixt with *verdegreaſe*; ſhade with brown oker, and give their bluſh with a thin or deep lake (reſembling nature) and heighten with white.

If you would have them very high coloured, mix your white with ſome maſticote; but this muſt be according to the condition of the fruit, whether ripe or unripe, red, yellow, or green, *&c.*

Cabbage white. Do over with very thin *yellow*, and in ſome places with very thin *green* (or yellowiſh green) ſweetening with very thin brown *oker*, mixt with *ſap-green*; heighten with pure *white.*

Cabbage red. Lay with *purple*; ſhade with *lake*, and heighten with *purple* mixt with *white.*

Cherries. With *vermilion* and ſome *braſil*; ſhade with *lake*; heighten with *vermilion* mixt with *white.*

Heart cherries. Colour in the middle with *vermilion* and *lake* mixt with *white*, the circumference remaining whitiſh, here and there ſweetening them with lake, and heightening with *white*, mixt with a little *lake.*

Cucumbers. Colour the ends with a thin *yellow*, the middle with *green*, ſweetening the one into the other; and ſhading with *ſap-green*, but the whole fruit with brown oker; lay the ſpecks to the life with *red* and *black.*

Red and blue grapes. Colour with *purple*, ſhaded with *blue*, and heightened with *white.*

White grapes. Colour with thin *verdigreaſe* (which is call'd *Spaniſh* green) mixt with *maſticote*; ſhadow with thin *verdigreaſe*, and heighten with *maſticote* mixt with white.

Melons yellow. Colour with *yellow*, ſhaded with *brown oker*, the veins with ſtronger *brown oker*, and then heightened with *white.*

Green Melons. Do with *Indigo* mixt with *verdegreaſe* and *ſap-green*, ſweetened the one into the other, and ſhaded with *ſap-green*, but the whole fruit with brown *oker*; lay the ſpecks with *red* and *black* to the life.

Mulberries. Colour with a very ſtrong *Braſil*, and lay them over with *black*, ſo that between the ſtalks and berries they may look a little reddiſh, according to nature.

Peaches. Colour them with thin *maſticote*, ſhaded with brown *oker*; give them a bluſh with *lake*, and heighten them with white.

Pears. Do over with *maſticote*, ſhaded ſweetly with *brown oker*, and give them a bluſh with a thin deep lake (reſembling nature) and heighten with white.

Blue plumbs. Colour with *purple* ſhadowed with *bice*, and about the ſtalks with a little green, well ſweetened; heighten with *purple* and *white.*

White plumbs. Do over with thin *maſticote*, ſhaded with brown *oker*, and give them a bluſh with *lake*, and heighten them with *white.*

Radiſhes. Do them over with *white*, ſhaded with *lake* and ſweetened (as it were behind) with *purple*, and ſometimes with green from the top downwards.

Lay the green leaves at the top with *verdigreaſe* mixt with *ſap-green*, ſhaded with *ſap-green*, and heightened with *maſticote*.

Strawberries. Lay them over with a white ground, and draw that over with vermilion, and lake very thin; ſhade it with fine *lake*, and heighten with *maſticote* mixt with *minium*; and then with white, only ſpeck them with *lake*, by one ſide of which put a ſmaller ſpeck of *white*.

Turnips. Lay them over with *white*, ſhaded with *ſoot*; the leaves as the radiſh leaves.

Wallnuts with their green on. Do with *verdigreaſe* mixt with *ſap-green*; ſhade with *ſap-green* and a little *white*.

Wallnuts without their green. Do over with *brown oker*, ſhadow with *ſoot*.

FRUITFULNESS is repreſented by a lady ſitting on a bed, and two little infants hanging about her neck.

F. T. F. ſignifies *Flaminio Torre fecit*, the mark of a painter and engraver.

F. V. F. } ſignifies *Francis Vannes fecit.* *Francis Villa-*
F. *Villam.* F. } *mena* alſo us'd the ſame mark.

ISAAC FULLER was an *Engliſh* hiſtory painter of good note. He had a great genius for drawing and deſigning hiſtory. Many perfections in his works may be ſeen by his reſurrection at *All-Souls* college chapel at *Oxford*, to which that at *Magdalen* college (though performed by the ſame hand) cannot in the leaſt compare. There is alſo at *Wadham* college in the ſame univerſity a hiſtory piece of his in colours admirably well performed. He may be reckoned amongſt the foremoſt in account of *Engliſh* painters; he ſtudied many years in *France* under *Perrier*, and underſtood the anatomical part of painting, perhaps equal to *Michael Angelo*, following it ſo cloſe that he was very apt to make the muſcelling too ſtrong and prominent. Amongſt his works there are ſeveral fine pieces in many great taverns in *London*, which are not eſteemed the worſt of his performances. He died in *London* about fifty-ſix years ago.

The manner of building FURNACES *for making* GLASS.

Agricola mentions three ſorts of *Furnaces* for making glaſs; the firſt he calls *fornax calcaria* or *calcar*, which is that where the frit is made.

This furnace is made in the faſhion of an oven, about ten foot high and ſeven broad; this furnace has two vaults, the one A, as in the plate figure 1. is that wherein the fire is made, having a hole on the top, through which the flame paſſes into the upper vault markt B, where it is reverberated from the roof upon the ingredients that make the frit, which are laid on the area or floor of this oven or vault, in which they are kept continually ſtirred about by the workman till they are vitrified and fully prepar'd. There ought to be a very large mouth to this vault, that the frit may be eaſily ſtirr'd about by the workman; whereas there ſhould be but a ſmall mouth to the under vault, as ſerving only to put in the wood for maintaining a continual fire, and taking out the aſhes.

In *Agricola*'s time, they made uſe only of coals in glaſs-houſes; but the moderns have found that wood is much better, becauſe being thoroughly dryed, it does not ſmoke like coals, which always makes the glaſs dull and obſcure.

The lumps which lie by the furnace mark'd C are the *frit*, which they break when they are too big, to make them fit to go into pots for the great furnace, there to be purified, and rendered fit to be employ'd as occaſion ſhall require.

The ſecond furnace, or rather oven, which *Agricola* ſpeaks of, is the working furnace, that where the workmen work; but the deſcription he gives of it is not in the beſt form, for he makes all theſe ovens round, whereas tho' they are to be round within, they ſhould be oval without.

And beſides he gives two mouths in form of chimneys, into which a ſervitor throws coals day and night, which is not now in uſe, ſince there is only dry wood in uſe, and then the iron grates which he ſpeaks of for the mouth and aſh-hole are of no uſe among us.

The diameter of this oven ought to be always proportional to the height, the oven being divided into three parts, each of which three parts is vaulted.

That below mark'd A is that where the ſtoker flings in the wood to keep a continual fire, and without ſmoke; and this lower oven is call'd the crown, and the mouth the *bocca*; but it has in it neither grates nor aſh-hole, the wood being caſt in on the coals, always taking care to take ſome of them out, when they are too many, with a large iron hollow ſhovel.

This oven made like a crown, to which *Agricola* allows but one hole in the middle of its height, about one foot diameter, has notwithſtanding ſeveral holes all round it, for the vent of the flame, which aſcends into the ſecond oven thro' the middle, where the pots fill'd with the ingredients for making the glaſs are plac'd at E, upon which that flame perpetually reverberates. See plate 1.

The ſecond part of this oven mark'd B, the vault of which is round, ſerves the workmen.

Agricola allots to each of theſe ovens eight arches; nevertheleſs we ſeldom, if ever, make more than ſix. Between each arch there is an opening or hole, made in the faſhion of a window archwiſe, mark'd C, call'd the great work hole, through which the pots which contain the metal, are put in and taken out.

Theſe large holes are ſtopp'd each with a cover, made of the ſame lute and brick that the oven is, to preſerve the workmen's eyes from the too vehement heat, and likewiſe to keep that the ſtronger in the oven.

In the middle of every one of theſe covers, there is a hole ſomething more than a palm wide, which is call'd the little working hole, through which the workmen take with their hollow irons the coloured or finer metals out of the pots, with which they make bottles, drinking glaſſes, or what ſort of veſſels they pleaſe.

It alſo ſerves for ſcalding their veſſels, when they have occaſion, and which reſt upon hooks, made on purpoſe on the ſides of thoſe holes, which the workmen call the little working holes.

The place where they put the pots in the oven, is call'd the floor or ground ; there are always two to each working hole in the little glaſs-houſes; the diſtinction between which and the great ones will be made anon.

The one, which is the leſſer, is full of fine metal, fit to work; and the other, which is the greater, is fill'd with metal that is to be purified or made fine. When the little pot is empty, it is immediately fill'd again with melted matter with an iron ladle, from the greater pots, when it has been refin'd ; and when the great pot is empty, it is fill'd again with new matter to be melted and refined, which is done alternately, that the workmen may not ſtand ſtill.

The upper vault of this furnace mark'd D, which is above that where the metal is melted, and the workmen work, ſerves to ſet the veſſels new made upon, there to cool by degrees, that place having only a moderate heat ; otherwiſe, if the veſſels were too ſoon expos'd to the cold air, they would break.

This upper vault may alſo be divided into two, the one half of it being ſufficient for cooling the veſſels, and the other may be made a *Balneum Mariæ* of divers degrees of heat, ſand furnaces, or of aſhes for purifications, digeſtions, diſtillations, and other uſes, and may ſerve for the preparations of the ingredients, wherewith the tinctures are made for glaſs and cryſtal, which you will find treated of under their proper articles.

The third *Furnace* of which *Agricola* makes mention, he makes of a ſquare form, and which, he ſays, is for making green glaſs; this is now no more in uſe, ſince they are all round on the inſide.

The

The ovens of the great glaſs-houſes are round within and oval without, like thoſe of the little glaſs-houſes, already treated of; but there is this difference, that any ingenious workman can build thoſe of little glaſs-houſes; but there is in *France* only one race of maſons, who have the ſecret of building the great ones. The difficulty conſiſts in this, that they muſt have three degrees more of heat than the little glaſs-houſes, and one inch difference in the arch and body of the oven is enough to ſpoil the whole proceſs.

Theſe ovens are built like thoſe before-mentioned, except as to the proportions which augment the heat three degrees beyond the others; they have ſix arches, two of which ſerve to heat the matter before you put in the pots, and another to heat the pots before they are ſet into the oven, when there is occaſion to change them.

In this oven each working hole has but one pot in it, and in the further end of the oven on the other ſide of the workmen, there is a great pot wherein the matter or ingredients is prepar'd, out of which it is taken with an iron ladle of ten or twelve foot long, to fill their pots, who work at the rates the pots are emptied; after that the great pot is fill'd again with other matter, to be refin'd and prepar'd as before.

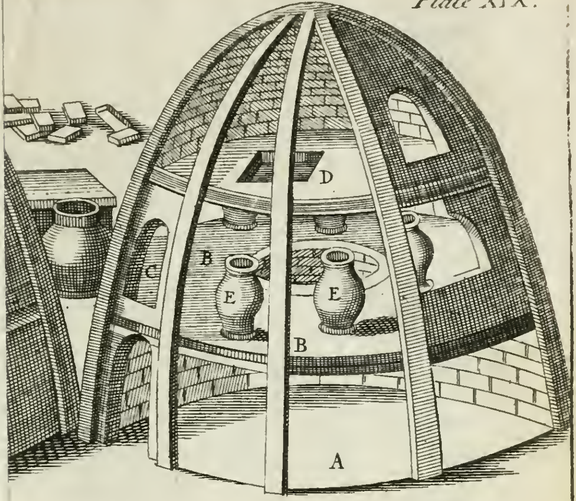
The materials which ſerve for the building theſe furnaces are bricks for the outward parts, and a ſort of ſuller's earth for the inward parts, which is gotten in *France* from *Beliere* near *Forges*, and which is the only earth in all *France*, which has the property of not melting in this exceſſive heat; and it is of this ſame earth alſo that the pots are made, which will hold the metal for a long time.

The worſt and rougheſt work in this art is the changing the pots, when they are worn out or crackt; for that the cover of the great hole of the oven or working hole muſt be taken off, and the ſaulty pot ſo taken out, and a new one put in its place through the flames, and that very ſpeedily; the one is done with only hands, and the other is perform'd with iron hooks and forks.

But before they ſet about this rough work, thoſe who do it clothe themſelves in a ſort of skins in the ſhape of a pantaloon, which they make as wet as poſſible, and which covers them all over except the eyes; and for them they make uſe of glaſs to ſee to guide themſelves.

And indeed without ſuch a ſort of clothing it would be almoſt impoſſible to manage this change of the pots, by reaſon of the long time that it would otherwiſe take up, and which would be yet more incommoded by the vaſt and intenſe heat proceeding from the great mouth of the furnace.

Plate XIX.



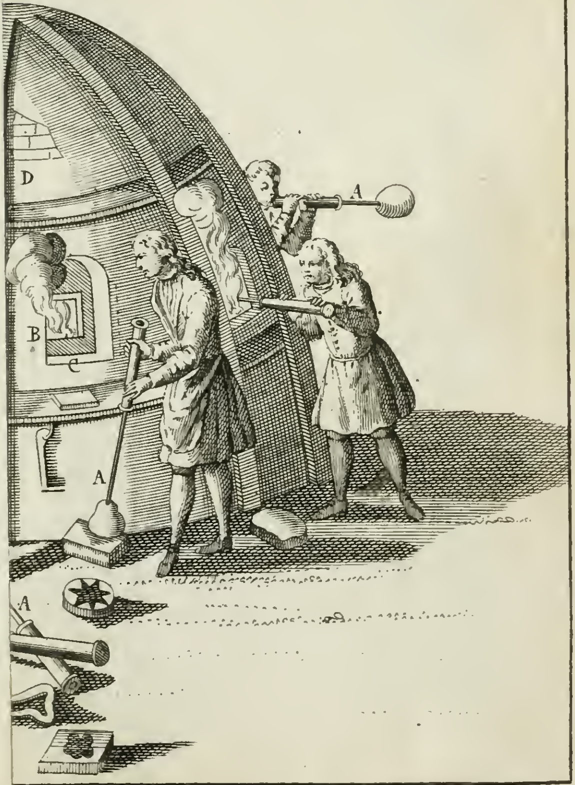
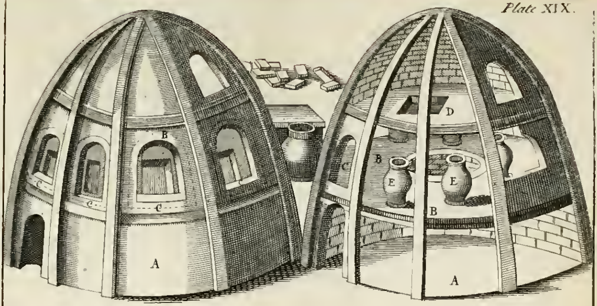
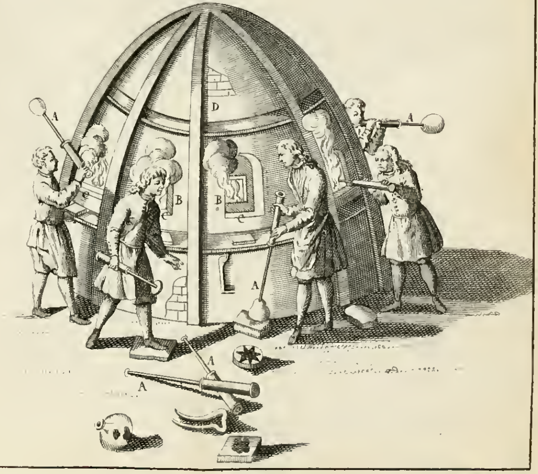


Plate XIX.





FULLING is the art or act of cleanſing, beating and preſſing cloths, ſtuffs, ſtockings, to render them ſtronger, cloſer and firmer, call'd alſo milling.

The *Fulling of cloths* and other ſtuffs is perform'd by a water mill, thence call'd a *fulling* or *ſcouring mill.*

Theſe mills differ not much from corn-mills, except in what relates to the millſtones and hopper; and there are ſome which ſerve indifferently for either uſe, cloths being full'd and corn ground by the motion of the ſame wheel.

And in ſome places and particularly in *France*, the *fullers* are call'd *millers*, as milling ſtuffs and grinding corn both at the ſame time.

The principal parts of the *fulling mill* are the *wheel*, with its trundle, which gives a motion to the *tree* or ſpindle, whoſe teeth communicate it to the *peſtles* or ſtampers, which are hereby rais'd up and let fall alternately, according as its teeth catch on or quit a kind of latch in the middle of each peſtle.

The peſtles and troughs are made of wood, each trough having at leaſt two and ſometimes three peſtles, as the owner ſhall think fit, or according to the force of the ſtream of water.

In theſe troughs are put the cloths, ſtuffs, &c. that are to be *fulled*; then the current of water being let fall on the wheel, the peſtles are ſucceſſively rais'd and let fall upon the cloth, &c. in the troughs, and by their weight and velocity, ſtamp and preſs the ſtuffs very ſtrongly, which by this means become thickened.

In *Fulling* they ſometimes make uſe of urine, ſometimes of fullers earth, and ſometimes ſoap.

Theſe ſtuffs are prepar'd to receive the firſt impreſſions of the peſtle by laying them in water and urine; then in fullers earth and water; and laſtly in ſoap diſſolv'd in hot water.

Soap alone would do very well, but that it is expenſive, tho' fullers earth in the way of the *Engliſh* dreſſing is ſcarce inferior to it; but then it muſt be well clear'd of all ſtones and grittineſſes, which are apt to make holes in the ſtuff.

As to urine, that is accounted prejudicial, not ſo much upon account of its ſmell, but its ſharpneſs and ſaltneſs, which is apt to render the ſtuffs dry and harſh.

The true method of *Fulling* with *ſoap* is delivered by Monſ. *Colinet* in an authentick memoir on that ſubject, ſupported by experiments made by order of the Marquis *de Louvois*, then ſuperintendent of the arts and manufactories of *France*. The ſubſtance of which is as follows.

A colour'd cloth of about forty-five ells is to be laid in the uſual manner in the trough of a fulling mill, without firſt ſoaking it in water, as is the common practice in many places.

Fifteen pounds of ſoap will be required to full this trough of cloth, one half of which is to be melted in two pails of river or ſpring water made as hot as the hand can well bear it.

This ſolution is to be pour'd by little and little upon the cloth, in proportion as 'tis laid in the trough; and thus full'd for full two hours and more; after which it is to be taken out and ſtretcht.

Which being done, the cloth is to be immediately put again into the ſame trough without any new ſoap, and then full'd for two hours more; then it is to be taken out, and wrung well to expreſs or ſqueeze out all the greaſe or filth.

After the ſecond *Fulling* the remainder of the ſoap is melted as the former, and caſt at four different times on the cloth, always remembring to take out the cloth to ſtretch it every two hours, and to get out the plaits and wrinkles it has acquired in the trough.

When it is perceived to be ſufficiently fulled, and brought to that quality and thickneſs it ſhould be, it is ſcoured out for good in hot water, keeping it in the trough till quite clean.

As to white cloths, becauſe they full more eaſily, and in leſs time than colour'd ones, a third part of ſoap will ſerve.

FULLING of ſtockings, caps, *&c.* ſhould be perform'd ſomething differently, *viz.* either with the feet or the hands with a kind of rack or wooden machine, either armed with teeth of the ſame matter, or elſe horſes or bullocks teeth.

The ingredients us'd in *Fulling*; theſe are urine, green ſoap, white ſoap, and *Fullers* earth; but the urine is look'd upon as prejudicial.

Wove ſtockings ſhould be fulled with ſoap only; but knit ſtockings may have fullers earth uſed with the ſoap.

FURY is repreſented in painting by a man ſhewing madneſs in his looks, his eyes tied with a fillet, in a poſture as if he had a mind to throw a bundle of arms bound up; in a ſhort habit. The fillet denotes the underſtanding loſt, when madneſs has dominion; for madneſs is the blindneſs of the mind. The arms ſignify that *Fury* is ever armed for revenge; the ſhort garment ſhews that he reſpects neither decency nor good manners.

FUSTICK } FUSTOCK } is a yellow wood us'd in dying. The colour it yields is a fine golden yellow; but there ought to be ſome other ingredients mixt with it to make it laſting.

The tree that produces it grows in all the *Antilles* iſlands, but particularly in *Tabago*, where it grows to a very great height.

It is us'd by dyers, chiefly in dying blacks; but ſome ſay it ſhould not be us'd at all.

There is alſo another kind of *Fuſtick* or *fuſtel* growing in *Italy*, *Provence*, &c. us'd in dying a coffee-colour.

G.

G. A. ſtands for the heirs of *John Agucchia.*

GALATEA, a ſea goddeſs, is deſcrib'd as drawn in a chariot of a ſtrange form, by two huge dolphins, guided by two ſilver reins, held in the hands of old *Tritons* daughters; over her head a canopy of purple ſilk and ſilver, with her hair hanging careleſly on her ſhoulders.

She is alſo deſcrib'd as a moſt beautiful young virgin, her hair diſhevell'd and hanging careleſly about her ſhoulders, like ſilver threads; and at each ear a fair pearl, with a double ſtring of them (ſometimes) about her neck and left arm; a mantle of pure, thin, and fine white, waving as it were by the gentle breathing of the air, viewing in her hand a ſpunge made of ſea froth.

GANGES. This *Indian* river is repreſented in painting in the ſhape of a rude, barbarous ſavage, with bended brows of a fierce and cruel countenance, crowned with a palm, having as other rivers, his pitcher, and by his ſide a rhinoceros.

The plan of a GARDEN in *perſpective.*

What has been already obſerv'd is confirm'd by this plan, for drawing lines from all the diviſions on the baſe-line to the point of ſight, the diagonal will give the depth of the whole plan, and the diminution of all the little ſquares.

Laſtly, ſetting off the alleys, figures, *&c.* from the correſpondent quantities in the geometrical plan, the whole parterre will be found in perſpective, as is ſhewn in the figure.

Let the plan given you to diminiſh and put in perſpective be of what ſort ſoever, the readieſt way will ſtill be to draw a ſquare about it, and divide that into ſeveral leſſer ſquares.

For putting the grand ſquare with all the leſſer ones in perſpective by the ordinary rules, you have nothing elſe to do but to take care that every thing take up the ſame number of little ſquares in the diminiſh'd plan, as in the geometrical one, and the figure of the one will be found in the other. See the plate.

GARMENTS. In drawing garments, be ſure to draw the out-lines very true, becauſe the whole grace of a picture conſiſts moſt in the outmoſt draught, more than in the curious work within.

And to perform this exactly, the garments muſt be drawn ſo as to ſuit the body, and to bend and yield with it, and not ſtrait and ſtiff where that bends.

And to fit the garments rightly to the body, it muſt be well obſerv'd which ſide of the body bends in or out, that the garment may anſwer to the body upon the leaſt turning any way.

And that the garment may turn with it, you muſt obſerve where the body would come, if it were naked, and there draw the garments in the right place, making them bend according to the joints and limbs of the body, and ſometimes thoſe plainly do appear through the garments, eſpecially where the garments are driven by the wind, or by any other cauſe, lie cloſe to the body, or looſe from it.

Indeed where the body or any part of it ſticks out more than the other, it ſhould be ſhewn in a plain and viſible manner, through the *Garments.*

Begin at the upper part of the *Garment*, and ſo draw down that part of the *Garment* (on both ſides) that lies cloſe to the body, before you draw the looſe parts that fly off from the body; for if you draw the looſe parts firſt before you have finiſhed thoſe parts that lie cloſe to the limbs and parts of the body, you will be ſoon out, and apt to place the body awry and crooked; therefore many maſters draw the naked body firſt, and the *Garments* afterwards, by which means they can better ſee to place the garments rightly, ſo as to hang even upon the body. By theſe means you may be ſure to place the body ſtrait, by drawing thoſe parts of the garments firſt that lie neareſt upon the body or limbs.

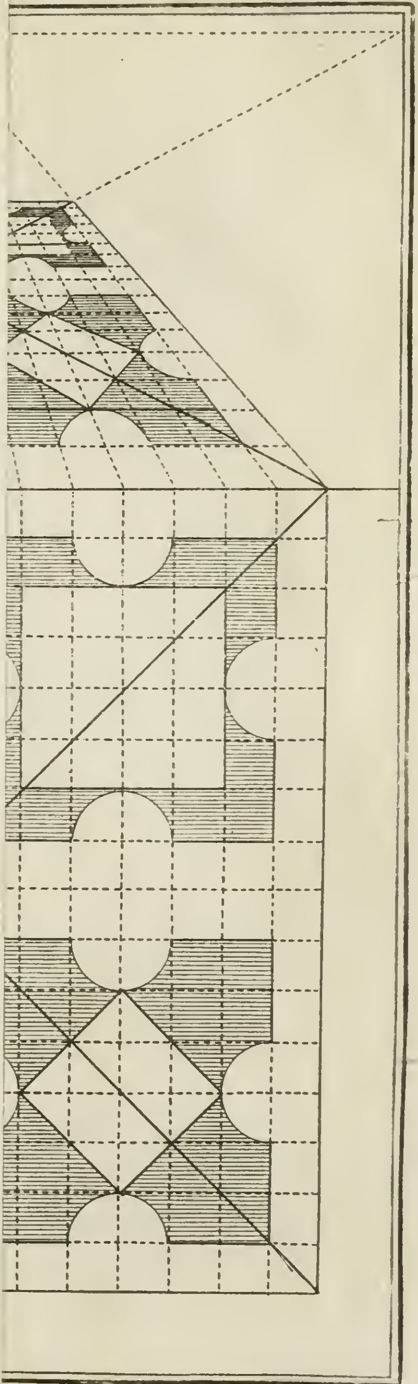
You muſt draw the greateſt folds firſt, and ſo ſtrike the greater folds into the leſs; and be ſure not to let one fold croſs another.

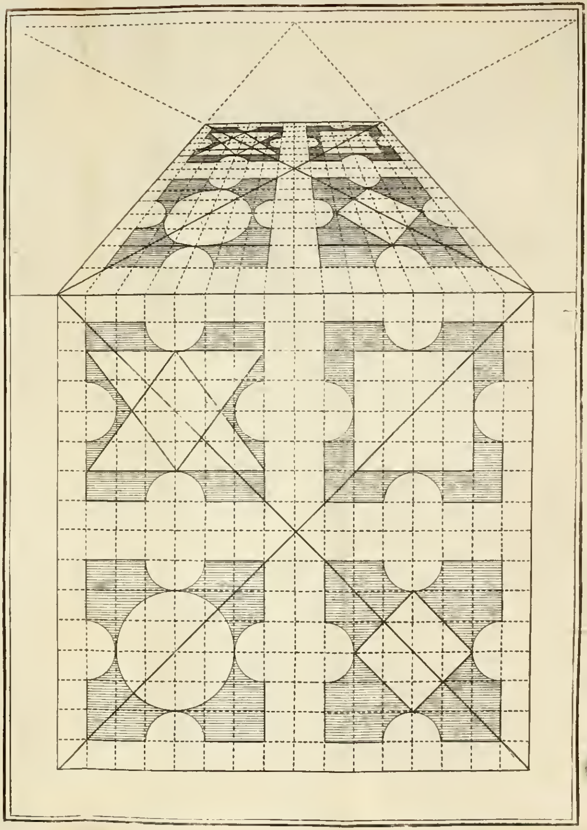
Break alſo ſome of the great folds into the leſs, and the cloſer the garment fits the narrower the folds muſt ſit.

And you muſt obſerve to order the garments ſo, that the folds may fall all one way, eſpecially in a ſtanding figure; tho' ſometimes it will be otherwiſe, as when a figure is drawn ſitting. But the *Garments* of a ſtanding figure are ſubject to be driven by the air, and therefore muſt be placed one way. But you muſt alſo take care not to fold the *Garments* in any place, where they ſhould ſit ſtrait, as the breaſts, knees, and thighs which bear them out; which muſt be ſurpriz'd by the appearance of them thro', and therefore the *Garments* muſt ſit plain. See DRAPERY.

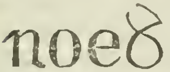
Of ſhadowing GARMENTS, *and placing the lights.*

Let all lights be plac'd one way in the whole piece, whether in figure, faces or garments. If the light fall ſideways on the picture, you muſt make the other ſide (which is furtheſt from the light) darkeſt. And let the light be plac'd all together on the one ſide, and not confuſedly on both ſides alike, as if it ſtood in the midſt of many lights; for the body cannot otherwiſe be lightened equal in all places. Never-





Nevertheleſs you may obſerve, that in expreſſing a dungeon or a priſon, wherein a torch or candle is lighted, you muſt obſerve that every thing in it, as well as the garments, muſt receive their light from it, and therefore muſt be ſhadowed all on the contrary ſide, that is on that ſide fartheſt from it. See the articles LIGHT and ſhadow.



NOEL GARNIER, engraver of groteſques, ornaments and figures, particularly of arts, in forty-eight pieces. He uſed this mark.

MARK GARRARD, Son of *Mark Garrard*, and born at *Bruges* in *Flanders*. He was ſometime principal painter to Queen *Elizabeth*, afterwards to Queen *Anne*, royal conſort to King *James* I. He was both a good hiſtory and face painter; he died in *London* in the year 1635, in the ſeventy-fourth year of his age. There are ſeveral of his prints extant among us.

HENRY GASCAR, a *French* face-painter, encouraged here by the Ducheſs of *Portſmouth*, whoſe picture he came over to draw. Many following her example, employed him alſo, ſo that he got a great deal of money in *England* in a ſhort time, nor could our wiſe nation ſee the difference between him and his cotemporary Sir *Peter Lely*. What the former wanted in the graceful part, in draught and a good choice of nature, the talent of but very few, he uſually made up with embroidery, fine cloaths, laced drapery, and a great variety of trumpery ornaments, which took for a while, till at length Monſieur found that his gay cap and feather would no longer ſucceed here, which made him leave *England* about fifty-one years ago, and by a prevailing aſſurance cuſtomary with his nation, he has ſince impoſed as much on the *Italian* nobleſſe, as he did on thoſe of *England*; and was lately living in *Rome*, though we hear he is now dead. He is reported to have carried above ten thouſand pounds out of *England*.

GEMS. The deſign of this work is to make art imitate nature, which may in this be done to ſuch a degree, as that the *artificial gems may ſeem to ſurpaſs the natural oriental ones in beauty and colour*, and want nothing of their perfection but the quality of hardneſs.

The *baſis* of *artificial gems* is natural or rock-cryſtal, which is a ſubſtratum made only of a congealed water, and a pure ſubtile earth, as other precious ſtones are.

But *precious ſtones* differ from *cryſtal* in this, that they are tinged with a proper ſulphur or unctuous ſubſtance, which has inſinuated it ſelf into the pores of their compoſition, which not only tinges them, but alſo fixes them, and gives them that admirable beauty, and hardneſs which they poſſeſs, This ſulphur is ſuppos'd to be an exhalation of metalline and mineral ſpirits, aſcending up by the force of a terrene central fire, containing a vaſt number and variety of colours, undetermined, till brought into act, and fix'd in their proper ſubjects.

Now the art of making theſe counterfeit *Gems* is the imitation of nature, by giving to a proper matter or body, ſuch as is that of rock-cryſtal, ſuch metalline and mineral tinctures, as ſhall be extracted from metals or minerals, perfectly fine and ſubtile in themſelves, and able to reſiſt the fire; and theſe tinctures, tho' volatile, are fix'd in cryſtal without altering their colour.

As for inſtance, *verdegreaſe*, when put on the fire, though it changes its colour, yet being mixt with cryſtal in fuſion, it becomes fixt and unchangeable in its tincture; for metalline and mineral colours always return to their principle, and tho' they be volatile, yet they are retain'd by the great quantity of the ſixed, which chains or over-powers them.

Therefore, for this purpoſe, thoſe unalterable colours are to be choſen, which have a fixity in the midſt of fire, being mixt one with another, as for inſtance, *blue* and *yellow* make a *green*; therefore you muſt take ſuch a blue as cannot be altered by fire, nor be totally overcome by the *yellow*, that you mix with it; as alſo a *yellow*, that the fire cannot change, nor yet be totally overcome by the *blue*.

Iſaac Hollandus is ſaid to be the firſt that wrote on this ſubject, and firſt diſcovered this admirable art of making artificial *Gems*, and who perform'd many other things almoſt incredible.

And you will find diſpers'd in this work, under their proper articles, his preparations for this purpoſe, as to paſtes, tinctures and methods of working them, in making artificial *agates*, *berils*, *diamonds*, *emeralds*, *granates*, *rubies*, *ſapphires*, *topazes*, &c.

To prepare the ſalts for counterfeit GEMS.

The ſalts us'd in making counterfeit *Gems* are chiefly two, the firſt is made of the herb *kali*, the ſecond of *tartar*; their preparations are according to the uſual way (but in glaſs veſſels.)

To prepare the matter of which GEMS *are made.*

The matter is either *cryſtal* or *flint* that is clear and white; put them into a crucible in a reverberatory fire (the crucible being covered) then take them out and caſt them into cold water, ſo will they crack and be eaſily reduced to powder; to which powder take an equal quantity of ſalt of *tartar* (or *ſal alkali*) to which mixture add what colour you pleaſe, which muſt be either metalline or mineral; put them into a very ſtrong crucible (filling it about half full) cover it cloſe and melt it all in a ſtrong fire, till it becomes like glaſs.

Take notice, that in melting you muſt put an iron rod into it, and take up ſome of it; and if it is free from bubbles, grains or ſpecks, it is fus'd enough; if not, you muſt fuſe it till it is free.

GENEROSITY is repreſented in painting by a virgin ſo amiable that ſhe attracts all eyes, cloth'd in a mantle of gold gauze, leaning her left hand upon a lion's head, holding in her right (lifted up) chains of pearl and precious ſtones, as if ſhe meant to make a preſent of them.

Her youth denotes her extraordinary courage and generoſity, which never degenerates; the naked arm, the property of this virtue to diveſt itſelf of all intereſts, and to be kind without hope of receiving any thing in exchange. The lion declares grandeur and courage.

GENIUS is repreſented in painting by a naked child of a ſmiling countenance, with a garland of poppy on his head, ears of corn in one hand, and a bunch of grapes in the other.

It is taken to be the inclination to ſomething, for the pleaſure it affords, to ſome in learning, to ſome in muſick, and to ſome in war.

The *Antients* took it for the common preſervation of worldly things, and amongſt them not only human beings had their genius, but even inſenſible things alſo.

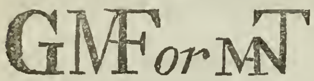
HORATIO GENTILESCHI was an eminent *Italian* hiſtory painter, born at *Piſa* a city in the Dukedom of *Tuſcany* in the year 1578, after having made himſelf famous at *Florence*, *Rome*, *Genoa*, and in moſt parts of *Italy*, *Savoy*, and *France*, at laſt, he upon the invitation of King *Charles* I. came over to *England*, and was well received by him, who appointed him lodgings in his court, gave him a conſiderable ſalary, and employed him in his palace at *Greenwich* and other places; his moſt remarkable performances in *England* were the cielings at *Greenwich* and *York-Houſe*, the latter of which are now in the collection of the preſent Duke of *Buckingham*. He did alſo a *Madonna*, a *Magdalen*, and *Lot* and his two daughters for King *Charles*; all which he performed admirably well. The piece of his which was moſt eſteemed abroad, was the portico of Cardinal *Bentivoglio*'s palace at *Rome*; he made ſeveral attempts of face-painting while in *England* with little ſucceſs, his talent lying wholly towards hiſtory, with figures as large as the life, in which he excell'd. He was much in favour with the Duke of *Buckingham*, and many of the nobility of that time; but after twelve years continuance in *England*, he died here in the year 1662, aged eighty-four, and lies buried in the Queen-Dowager's chapel at *Somerſet-Houſe*. His print is among the heads of *Van Dyck*, he having been drawn by that great maſter.

ARTEMISIA GENTILESCHI was but little inferior to her father in hiſtories, and even excell'd him in portraits, a manner of painting which moſt are inclined to attempt who come to *England*, where it is chiefly in vogue. She lived the greateſt part of her time at *Naples* in much ſplendor, and was as famous all over *Europe* for her amours as for her painting. She recommended herſelf to the eſteem of the skilful by many hiſtory pieces as big as the life, amongſt which, the moſt celebrated was that of *David*, with the head of *Goliah* in his hand. She drew alſo the portraits of ſome of the Royal Family, and many of the nobility of *England*.

GEOGRAPHY is repreſented in painting, &c. by an old dame in an earth-coloured garment, a terreſtrial globe at her foot, the compaſſes in her right-hand, wherewith ſhe meaſures the ſaid globe, and a geometrical ſquare in her left.

Her old age denotes the antiquity of this art; the compaſſes the meaſuring and deſcribing the earth, which is truly *Geography*; the ſquare, the taking ſeveral proportions, length, breadth, &c.

G. F. ſignifies *Giorgio* of *Mantua fecit*. In a piece of *Primaticcio's*, repreſenting *Vulcan's* forge.



These two marks were uſed by *Giorgio Ghiſi* of *Mantua*, he ſometimes put *Ghiſi Mantouan fecit*.

RICHARD GIBSON, commonly call'd the *Dwarf*, was a diſciple of *Francis de Cleyn*, and an eminent maſter in the time of Sir *Peter Lely*, to whoſe manner he devoted himſelf, and whoſe pictures he copied to admiration. Being page to a lady at *Mortlack*, ſhe put him to *de Cleyn* to learn to draw; which ſhe obſerv'd he had a particular genius to. He had the honour to inſtruct in drawing the late Queen *Mary*, when Princeſs of *Orange*, and Queen *Ann* when Princeſs; he went over to *Holland* to wait on the princeſs *Mary* for that purpoſe; he painted both in oil and water colours, but chiefly in the latter; he was greatly in favour with King *Charles* I. (to whom he was page of the back-ſtairs) inſomuch that the King gave his wife in marriage, who was likewiſe a dwarf, and was not long ſince living though of a great age.

He received conſiderable favours from *Philip* Earl of *Pembroke*, who was his patron; he drew *Oliver Cromwell* ſeveral times, and died in *Covent-Garden* ſoon after the revolution, at ſeventy five years of age; he lies buried in that church.

WILLIAM GIBSON was nephew to the foregoing, and inſtructed both by him and Sir *Peter Lely*, his greateſt excellencies lay in his copies, after the laſt of thoſe two maſters, whoſe manner he made it his chief endeavour to imitate, and herein he was not altogether unſucceſsful; he became an eminent limner, and drew a great many portraits for many of the beſt rank. His great induſtry was much to be commended for purchaſing not only the greateſt part of Sir *Peter*'s collection after his death, but likewiſe for procuring beyond ſea, a great many valuable things in their kind, that he may well be ſaid to have had the beſt collection of drawings and prints, after the greateſt *Italians* and other maſters, of any perſon of his time; he was a great encourager of the art he profeſs'd; he died lethargick in *London*, and was buried at *Richmond* in *Surrey* in the year 1702, at fifty eight years of age. His kinſman Mr. *Edward Gibſon* was inſtructed by him, and firſt painted portraits in oil, but afterwards finding more encouragement in crayons, his genius lying that way, he made a conſiderable progreſs therein, till death intervening put a ſtop to all his endeavours. He died young at thirty three years of age, and lies likewiſe buried at *Richmond*.

GILDING is the art of ſpreading or covering a thing over with gold, either in leaf or liquid.

The art of *Gilding* was not unknown to the ancients; though it never arriv'd among them to the perfection to which the moderns have brought it.

Pliny relates, that the firſt *Gilding* that was ſeen at *Rome* was not till after the deſtruction of the city, in the time of the conſulſhip of *Lucius Mummius*; at which time they began to *gild* the ceilings of their temples and palaces; the capitol being the firſt ſtructure adorn'd with this inrichment.

He alſo adds, that luxury grew ſo haſtily upon them, that in a little time you might ſee all even private and poor perſons *gild* the very walls, vaults, *&c.* of their houſes.

But we have this advantage of the ancients in the manner of uſing and applying the gold, the ſecret of painting in oil, lately diſcovered furniſhes us with means of *Gilding* works, that will endure all the violences of time and weather; which was impracticable to the ancients.

They knew no way of laying the gold on bodies, that would not endure the fire; but with whites of eggs or ſize, neither of which will endure the water; ſo that they could only *gild* thoſe things, which ſtood in ſuch places as were ſheltered from wet, and the humidity and moiſture of the air.

The *Greeks* us'd a ſort of compoſition for *Gilding* on wood, which they call'd *leucopheum* or *leucophorum*; which is deſcrib'd as a ſort of glutinous compound earth, which in all probability ſerv'd to make the gold ſtick and bear poliſhing.

But as to the particulars of this earth, its colour, ingredients, *&c.* naturaliſts and antiquaries are not agreed.

There are ſeveral methods of *Gilding* in uſe among us, as *Gilding* in *water*, *Gilding* in *oil*, *Gilding* by *fire*, &c.

The method of WATER GILDING.

Water Gilding requires more preparation than *oil Gilding*, and is chiefly on wooden works, and thoſe made of *ſtuc*, and theſe too muſt be ſheltered from the weather.

A *ſize* is us'd for this way of *Gilding* made of ſhreads, *&c.* of parchment, or gloves boil'd in water to the conſiſtence of a gelly.

If the thing to be *gilt* be of *wood*, it is firſt waſh'd with this *ſize*, boiling hot; and then ſet to dry, and afterwards with white *paint*, mix up with the ſame *ſize.*

Some uſe *Spaniſh white* for this purpoſe, and others *plaſter* of *Paris*, well beaten and ſifted.

This *ſiz'd paint* muſt be laid on with a ſtiff-bruſh; which is to be repeated ſeldomer or oftener, according to the nature of the work, as ten or twelve times in flat or ſmooth works; but ſeven or eight will be ſufficient in pieces of ſculpture.

In the former caſe they are apply'd by drawing the bruſh over the Work, in the latter by dabbing it.

When the whole is dry, they moiſten it with fair water, and rub it over with ſeveral pieces of coarſe linen, if it be on the flat; if not, they beat or ſwitch it with ſeveral ſlips of the ſame linen tied to a little ſtick, to make it follow and enter all the cavities and depreſſures thereof.

Having thus finiſh'd the *white*, the next thing to be done is to colour it with yellow *oker*; but if it be a piece of ſculpture in relievo, they firſt touch it up, and prepare the ſeveral parts which may have happened to have been disfigured by the ſmall iron inſtruments, as gouges, chiſſels, *&c.*

The *oker* us'd for this purpoſe, muſt be well ground and ſifted, and mix'd up with the *ſize* beforementioned.

This colour is to be laid on hot; and in works of ſculpture ſupplies the place of gold, which ſometimes cannot be carried into all the depreſſures and cavities of the foliages and other ornaments.

A *lay* is alſo apply'd over this yellow; which ſerves for the ground on which the gold is to be laid; this *lay* is uſually compos'd of *Armenian bole*, *blood-ſtone*, *black-lead*, and a little *fat*; to which ſome add *ſoap* and *oil* of *olives*; others *burnt-bread*, *biſtre*, *antimony*, *glaſs* of *tin*, *butter* and *ſugar-candy*.

Theſe ingredients being all ground together with hot *ſize*, three *lays* of this compoſition is apply'd upon the yellow, the one after the other has been dry'd; being cautious not to put any into the cavity of the work to hide the yellow.

The bruſh us'd for this purpoſe muſt be a ſoft one, and when the matter is become very dry, they go over it again with a ſtronger bruſh to rub it down, and take off the ſmall grains that ſtick out; in order to facilitate the burniſhing of the gold.

To be prepared for *Gilding*, you muſt have three ſorts of pencils; one to wet, another to touch up and amend, and a third to flatten; alſo a *Gilding* cuſhion for ſpreading the leaves of gold on when taken out of the book. See CUSHION, a knife to cut them and a ſquirrel's tail fitted with a handle; or elſe a piece of fine ſoft ſtuff on a ſtick, to take them up directly and apply them.

You are firſt to begin with wetting your pencils; by which the laſt *lay* laid on with water is moiſtened, that it may the better receive and retain the gold. Then you are to lay the leaves of gold on the cuſhion, and if whole, you muſt take up with the ſquirrel's tail; but if in pieces, with the other inſtrument, or the knife wherewith they are cut, and lay and ſpread them gently on the parts of the work you had moiſtened before.

If the leaves (as they frequently do) happen to crack or break in laying on, theſe breaches muſt be made up with ſmall bits of leaf taken up upon the repairing pencil, and the whole work is to be ſmooth'd either with the ſame pencil or another ſomething larger; the gold being preſſed into the dents, into which it could not be ſo eaſily carried by the ſquirrel's tail.

The work having been thus far gilded, muſt be ſet by to dry in order to be either burniſhed or flatted.

Burniſhing is ſmoothing and poliſhing it with a burniſhing tool, which is uſually a dog's or woolf's tooth or a blood-ſtone fitted into a handle for that purpoſe. See BURNISHING.

Flatting it is giving it a light lick, in the places not burniſh'd, with a pencil dipt in *ſize*, in which a little *vermilion* ſometimes has been mixt. This ſerves to preſerve and prevent its flawing when handled.

The laſt operation is the applying the *vermeil* in all the little lines and cavities; and to ſtop and amend any little faults with ſhell gold.

The compoſition call'd *vermeil* is made of *gum guttæ*, *virmilion*, and a little of ſome ruddy brown colour ground together, with *Venetian varniſh* and *oil* of *turpentine*. Some gilders inſtead of this, make ſhift with fine *lucca* or *draggon's blood* with *gum water*.

Sometimes inſtead of burniſhing the gold, they burniſh the ground or compoſition laid on the laſt before it, and only afterwards waſh the part over with the *ſize*.

This method is chiefly practis'd for the hands, face, and other nudities in relievo; which by this means, don't appear ſo very brillant as the parts burniſhed; though much more ſo than the parts perfectly flat.

To gild a piece of work, and yet preſerve white grounds, they apply a lay of *Spaniſh white*, mix'd with a weak fiſh glue on all the parts of the ground, whereon the yellow or the laſt lay might run.

The method of GILDING *in oil.*

This operation requires much leſs *apparatus* than that before-mentioned.

The baſis or matter whereon the gold is laid, in this method is the remains of colours found ſettled to the bottom of the pots in which painters waſh their pencils.

This matter which is very viſcid or ſticky, is firſt ground, and then paſs'd through a linen cloth; and thus lay'd with a pencil on the matter to be gilt, after it has been waſh'd once or twice over with *ſize*; and if it be wood with ſome white *paint*.

When this is almoſt dry, but yet is ſtill unctuous enough to catch and retain the gold, the leaf gold is laid on; either whole, if the work be large, or cut to pieces if ſmaller; the leaves of gold are taken up and laid on with a piece of fine, ſoft, well carded cotton; or ſometimes by a palat for the purpoſe, or ſometimes with the knife with which the leaves were cut, according to the parts of the work that are to be gilded, or the breadth of the gold that is to be laid on.

As the gold is laid on, they paſs over it a coarſe ſtiff pencil or bruſh to make it ſtick, and as it were incorporate with the ground; and after this they mend any cracks that may have happened in it, either with the ſame pencil or one that is ſmaller; as has been ſhewn before in water *Gilding*.

This kind of *Gilding* is chiefly us'd for domes and roofs of churches, courts, banquetting-houſes, *&c.* and for figures of *plaſter* of *Paris*, *lead*, &c.

The method of GILDING *with liquid gold.*

This is perform'd by *gold* reduc'd to a calx and amalgamated with *Mercury*, in the proportion of about an ounce of *Mercury* to a dram of *gold*.

To perform this, they heat a crucible red hot, and then put the *gold* and *Mercury* into it, ſtirring them gently about till the *gold* be found melted, and incorporated into a maſs with the *Mercury*.

When this is done, they caſt them into water to waſh and purify them; and out of that into other waters, where the *amalgama* which is almoſt as liquid, as if there were nothing but quickſilver in it, may be preſerv'd a long time for uſe.

Before they proceed to lay this amalgamated *gold* on the metal, they firſt render the metal rough, by waſhing it over with *aqua fortis* or *aqua ſecunda*; and afterwards rinſe the metal in fair water, and ſcour it a little with fine *ſand*, and then it is ready for the *gold*.

Then they cover over the metal with the mixture of *gold* and *Mercury*, taking it up with a ſlip of copper or a bruſh made of braſs wire, ſpreading it as even as poſſible, to do which they wet the bruſh from time to time in fair water.

Then they ſet the metal to the fire upon a grate or in a ſort of cage, under which ſtands a pan of coals; and in proportion as the *Mercury* evaporating and flying off diſcovers the places where *gold* is wanting, they take care to ſupply them by adding new parcels of *amalgama.*

Then the work is rubb'd over with the wire-bruſh dipt in beer or vinegar, which leaves it in a condition to be brought to a colour, which is the laſt part of the proceſs; and which the gilders keep to themſelves as a mighty ſecret; though it is certain, it cannot differ much from the manner of giving *gold* ſpecies their colour in coining.

The method of GILDING *by fire on metal.*

There are two ways of performing this. The one with leaf *gold* and the other with liquid *gold.*

To prepare the metal for the firſt, they ſcratch it well or rake it; then poliſh it with a poliſher; and afterwards ſet it to the fire to blue, *i. e.* to heat, till it appear of a blue colour.

When this has been done, they clap on the firſt lay of leaf *gold*, rubbing it lightly down with a poliſher; and expoſe it thus to a gentle fire.

They uſually only give it three ſuch lays or four at the moſt, each lay conſiſting of a ſingle leaf for common works; and of two for extraordinary ones, after each lay it is ſet freſh to the fire, and after the laſt lay, the *gold* is in condition to be burniſh'd.

The way of GILDING *and* LACKERING *in oil.*

Of mixing and laying on the *gold ſize.*

1. Firſt prime the piece with the priming. Take the beſt *gold ſize*, *fat oil*, of each according to the quantity of your work, grind them well on a ſtone, and put them into a gally-pot.

2. Paſs the piece all over with a clean bruſh dipt into this *ſize*, but do not lay it on thick, jobbing and ſtriking the point of the pencil into the hollow places of the carv'd work, ſo that no part may eſcape; for if any place be untouch'd with the *gold ſize*, the *gold* will not ſtick upon it, and in thoſe places the work will be faulty.

Let it ſtand by (perhaps twenty four hours or more) ſo that it may be but juſt clammy enough to hold the metals, to know if it be in a fit condition; breathe upon it, and if your breath remains upon it like a miſt, you may then lay on your leaf *gold*; or if it is ſo dry, that it does not diſcolour, nor ſtick to your finger, but is clammy, and not parting very readily with your finger; it is then in a fit temper,

3. If you ſhould lay on your metal before the *ſize* is dry enough, it would as it were drown the leaf *gold*, *ſilver*, &c. and deprive it of its gloſs and luſtre; and if it ſhould be let ſtand till it is too dry, then the gold, *&c.* would not ſtick.

How to lay on leaf gold.

Cut the leaf *gold* and *ſilver* on your *Gilding* cuſhion, with a thin, broad, ſmooth, ſharp edg'd knife.

Then having your *pencil*, *cotton* or *pallat* ready (made of a ſquirrel's tail) breathe upon the *gold*, and touch and take it up, and lay it upon the place you intend for it, preſſing it down cloſe with your *pencil* or *cotton*.

And if any parts have eſcaped being covered with the *gold*, cut ſome ſmall pieces and lay them on; proceeding after this manner, till the whole work is gilded or covered with your metal.

After twenty four hours, jobb down and preſs over the whole work gently with a fine large bruſh, to make the *gold* ſtick upon all the uneven and hollow parts of the carving; then with fine ſoft ſhammy leather, as it were poliſh and rub it over ſmoothly.

This being done, the *gold* will appear of an admirable luſtre, and the beauty of it will be ſo durable, that though it be expos'd to the wind and weather, it will not receive any damage for many years.

GILDING. *To lay* gold *on any thing.*

Take *red-lead* ground fine, temper it with *linſeed-oil*, write with it, and lay leaf *gold* on it, let it dry and poliſh it.

To gild GLASS.

Take *chalk* and *red-lead* of each a like quantity, grind them together and temper with *linſeed-oil*; lay it on, and when it is almoſt dry, lay leaf *gold* on it; let it dry, and then poliſh it.

To gild IRON *with a water.*

Take *ſpring water* three pounds, *roch allum* three ounces, *Roman vitriol* and *orpiment* of each one ounce, *verdegreaſe* twenty four grains, *ſal gemma* three ounces; boil theſe all together, and when it begins to boil, put in *tartar* and *bay-ſalt*, of each half an ounce; continue the boiling a good while, then take it from the fire, ſtrike the iron over with it, dry it againſt the fire, and burniſh it.

To GILD IRON *or other metals with* GOLD.

Take one pound of liquid *varniſh*, *linſeed-oil* and *turpentine*, of each one ounce; mix them well together, ſtrike them over any metal, and afterwards lay on leaf *gold* or *ſilver*, and when it is dry, poliſh it.

To GILD *ſilver, braſs or copper with* GOLD WATER.

Take two ounces of *quickſilver*, put it into a crucible, ſet it on the fire, and when it begins to ſmoak, put in an angel of fine *gold*; then take it off immediately, for the *gold* will be preſently diſſolv'd; then, if it be too thin, ſtrain a part of the *quickſilver* from it through a piece of fuſtian; when you have done this, rub the *gold* and *quickſilver* upon *braſs* or *ſilver*, and it will cleave to it; then put the ſaid *braſs* or *ſilver* upon quick coals, till it begins to ſmoke, then take it from the fire, and ſcratch it with a hair bruſh; this do till all the *Mercury* is rubb'd as clean off as may be, and the *gold* appear of a faint yellow; then heighten the colour with *ſal armoniack*, *bole* and *verdegreaſe* ground together and tempered with water.

Where you muſt take notice, that before you *gild* your metal, you muſt boil it in *tartar* or *beer* and *water*.

Another water for GILDING *iron, ſteel, knives, ſwords*, &c.

Take *fire-ſtone*, reduce it to powder, put it into a ſtrong *red wine vinegar* in a glaz'd pot for twenty four hours, adding more *vinegar* to it as it evaporates or boils away; into this water dip the iron, ſteel, *&c.* and it will be black; dry it, and then poliſh it, and you will have a gold colour underneath.

Another way of GILDING IRON.

Take *ſalt-petre*, *roch allum* burnt, of each an ounce, *ſal armoniack* two ounces, all reduc'd to fine powder; boil them in ſtrong *vinegar* in a copper-veſſel, with which wet the iron, *&c.* and then lay on leaf *gold*.

Another way.

Grind *roch allum* with the *urine* of a boy, till it is well diſſolv'd, with which anoint the iron, heat it red hot in a fire of wood coals, and it will be like *gold*

Another way.

Put two ounces of *allum*, three ounces of *ſal gemmæ*, *Roman vitriol* and *orpiment*, of each one ounce, of *flos æris* twenty four grains into three pounds of *water*; and boil them all in *tartar* and *water*, as is directed in *Gilding iron with water.*

To make iron of a golden colour.

Take *linſeed oil* ſix ounces, *tartar* four ounces, *aloes* an ounce, *ſaffron* ten grains, *turmerick* four grains; *yolks* of *eggs* boil'd hard and beaten four ounces, boil them all in an earthen veſſel, and anoint the iron with the oil, and it will look like gold. If the *linſeed-oil* be not enough, you may put in more.

Another way for iron, glaſs or bones.

Take a new lay'd *egg*, make a hole at one end, and take out the *white* and fill up the *egg* with *quickſilver* two parts, *ſal armoniack* reduc'd to a fine powder one part; mix them all together with a wire or little ſtick, ſtop the hole with melted wax, over which put an half *egg-ſhell*; digeſt it in horſe dung for a month, and it will be a fine golden coloured liquor.

To GILD *on* WOOD *or* STONE.

Take *bole armoniack* and *oil* of *ben*, of each a ſufficient quantity; beat and grind them together, and ſmear the wood or ſtone, and when it is almoſt dry, lay on leaf *gold*, let it dry, and poliſh it.

To gild with leaf gold.

Grind leaves of *gold* in a few drops of honey, and add to it a little *gum water*, and it will be excellent to *write* or *paint* with.

To gild ſilk and linen.

Lay ſome parchment *glue* on the ſilk or linen, gently that it may not ſink; then mix and grind *ceruſs* and *verdegreaſe* together, of each a like quantity, mix them with varniſh in a glaz'd veſſel, let it ſimper over a ſmall fire, and keep it for uſe.

Another of a pure gold colour.

Take the juice of freſh *ſaffron*, or *ſaffron* ground, the beſt clear *orpiment*, of each a like quantity; grind them with goat's *gall* or *gall* of a pike (which is better) digeſt twenty eight days in horſe-dung, and it is done.

To gild iron or ſteel.

Take of *tartar* one ounce, *vermilion* three ounces, *bole armoniack* and *aqua vitæ*, of each two ounces, grind them together with *linſeed-oil*, and put to it the quantity of a hazle-nut of *lapis calaminaris*, and in the end grind a few drops of *varniſh*; then take it off the ſtone and ſtrain it through a linen cloth (for it muſt be as thick as honey) then ſtrike it over iron or ſteel, let it dry; then lay on your *ſilver* or *gold* and burniſh it.

To colour tin or copper of a gold colour.

Set *linſeed-oil* on the fire, ſcum it and put in *amber*, *aloes*, *hepatick*, of each a like quantity, ſtir them well together till it grows thick; then take it off, cover it cloſe, and ſet it in the earth for three days; and when you uſe it ſtrike the metal all over with it, let it dry, and it will be of a golden colour.

To ſilver any metal.

Diſſolve fine *ſilver* in ſtrong *aqua fortis*, and put in as much *tartar* finely powdered as will make it into a paſte; with which rub any metal, and it will look like fine *ſilver*.

To gild ſo as it ſhall rot out with any water.

Take calcin'd *oker* and *pumice-ſtone*, of each like quantities, and a little *tartar*, beat them with *linſeed-oil* and five or ſix drops of *varniſh*; ſtrain all through a linen cloth, and with this liquor you may imitate *Gilding*.

To

To gild paper.

Grind *bole armoniack* with *rain water*, and give one laying of it when it is dry, take *glair* of *eggs*, and add to it a little *ſugar candy* and *gum water*, which lay over the former, and upon this, when it is dry enough, lay leaf *ſilver* or leaf *gold.*

To gild the leaves of books.

Take *bole armoniack* eight penny weight, *ſugar candy* two penny weight, mix and grind them with *glair* of *eggs*, then on a bound book (while it is in the preſs, after it hath been ſmear'd with *glair* of *eggs* and is dry'd) ſmear the ſaid compoſition, let it dry, then rub it well and poliſh it; then with fair water wet the edges of the book, and ſuddenly lay on the gold, preſs it down gently with cotton, let it dry, and then poliſh it with a tooth.

Of GILDING *wood with burniſht gold and ſilver.*

1. Take parchment *ſize*, for *priming* or *whiting* the piece, do it over with this ſeven or eight times, letting it dry between every time.

2. If it is a carv'd frame, that is to be gilded, grind yellow *oker* fine with water, adding to it a little weak *ſize* to bind it; warm it and colour over the frame, and let it ſtand to dry.

3. Take either of the *gold ſizes.* (See SIZE) but rather the ſeventh, melt it and make it blood-warm; but ſo as it may be ſomewhat thin, ſtir it well with a fine bruſh, and *ſize* the piece over twice with it, without touching the hollows, or deepeſt parts of the carving; becauſe the yellow colour firſt laid on, is near in colour to the *gold*, and a fault in the *gold's* not taking, will not be ſo eaſily cover'd becauſe of the ſhadows.

4. Let it ſtand five or ſix hours to dry, and try if your *gold* will burniſh upon it, if not alter your *gold ſize*, and do it over again.

5. *To lay on the gold for burniſhing, do as follows.*

Having fixt your work almoſt upright, but in a poſture a little reclining that the water may run off, and not ſettle in any of the cavities; lay ſome leaves of *gold* on your *Gilding cuſhion*, which hold in your left-hand with your pallat and pencil; let alſo a baſon of water ſtand by you, and dry *whiting* to rub your knife ſometimes with, that the *gold* may not ſtick to it.

6. Then with a ſwan's quill pencil, or a large one of camel's hair, being dipt into the baſon of water, wet ſo much of your work as will take up three or four leaves, beginning at the lower part, aſcending and *Gilding* upwards, laying on either whole leaves or half leaves, or leſſer pieces as the work requires, taking care to make as little waſte of *gold* as poſſible.

7. When you have laid on the *gold* all over what you firſt wetted, then wet another part of the work, and lay on the leaves

of *gold* with your *pencil*, *cotton* or *pallat*, preſſing them down cloſe; following this method, till you have finiſh'd the whole piece.

8. Having done this, look over your work examining if any parts have eſcap'd *Gilding*, and if there is any ſuch cut ſome leaves of *gold* into ſmall pieces, and wetting the ungilded parts with a ſmall pencil, apply the bits of leaf *gold* to them, then ſet the work by for twenty four hours; but no longer, and then begin to burniſh it.

9. The *burniſhing* is to be perform'd with a tool call'd a burniſher, by rubbing it ſmoothly on it, till it attains a gloſs; and having burniſh'd ſo much of the work as you deſign, leave the ground of the carving untouch'd, and ſome other parts which you ſhall think fit; which being rough, if compar'd with the other, will ſet off and beautify that which is burniſh'd.

10. Thoſe parts which are not burniſhed, muſt be clothed or ſecur'd with *ſize*, *ſeed lac*, *varniſh* or *lacker*, if you would have it to be deep coloured; but you muſt take care to touch theſe parts only, and not that which has been burniſh'd.

11. Then the work is to be ſet off with *lacker varniſh*, mixt with *ſanguis draconis* and *ſaffron* or with *ornatto*, with which and a fine pencil touch the hollowneſs of the carving, hollow veins of leaves and foldings; and if you do not think it deep enough, go over it again, with the *lacker* before directed.

12. *To lay on ſilver ſize.*

Take *ſilver ſize* newly ground, and mix'd with weak *ſize*, warm it, and a clear pencil fit for the work, *ſize* it over once or twice, then let it ſtand to dry to a juſt temper, trying it whether it will *burniſh*, which if it will, burniſh it, but if not, you muſt *ſize* it again with ſome alteration in the *ſize*.

13. Then wet the work, and lay on the leaf *ſilver*, after the ſame manner directed for the laying on of leaf *gold*, and when it has been ſo done, burniſh it over, if it be not froſty weather; but if it be a hard froſty ſeaſon the priming will be apt to peel off, and the *ſize* will be apt to freeze in laying on.

14. Let your parchment *ſize* be ſomething ſtrong and new; for if ſtale, it loſes its ſtrength; nor ſhould you grind any more *gold* or *ſilver ſize*, then what you will want for preſent uſe.

And be ſure to keep your work clean and free from duſt both before and after it is *gold ſiz'd* and *gilded*; otherwiſe in *Gilding* it will be full of ſcratches, and look ill.

The method of GILDING *metals.*

In order to prepare the *gold* for this work. Take leaf *gold*, or ducket *gold* beaten very thin, and cut into little bits, what quantity you pleaſe, put it into a gally-pot, and put to it ſo much *quickſilver*, as will juſt cover it; ſtir them with a ſtick and make an *amalgama*, and when you have ſo done, ſtrain them through a piece of *ſhammy* leather, ſqueezing the leather hard with your hand; that which remains behind in the leather, and looks like *ſilver*, is the *gold amalgamated*, and that which is to be us'd in this work.

The method of Gilding *ſilver, or braſs, copper, or prince's metal.*

1. The thing to be gilded muſt firſt be ſcrubb'd with a wire bruſh and a little fair water, till it is perfectly clean.

2. Then having put an ounce of *quickſilver* into a vial, drop into it three, four or five drops of *aqua fortis*; with this mixture and a rag rub over the metal to be gilded, till it is every where as white as *ſilver*.

3. Then with a ſmall knife ſpread your *amalgamated gold* over the whole piece, taking care not to miſs any part of it; then give it a heat over a fire to force the *quickſilver* to evaporate or fly away, and the *gold* will remain ſticking cloſe to the piece.

4. But before you give it a thorough heat, let it have two or three little heats, that you may with a ſmall *hair bruſh*, almoſt like that of a *comb*, dab and ſpread the *gold*, which you may the eaſier do, becauſe the warmth you give it makes the *quickſilver* the more ready to ſpread; after which give it the thorough heat beforementioned.

5. Afterwards take it from the fire, and with a hair ſcrub bruſh, which has never touch'd *quickſilver*, rub and cleanſe it as you did before. And you muſt take notice, if there be any ſpot left ungilded, you muſt after you have cleans'd it with the wire bruſh, proceed again as before.

6. If you would have the work more rich and laſting, beſmear it again with *quickſilver* and *aqua fortis*, and lay on the *gold* again, after the ſame manner as before; and this you may repeat ſo often till the *gold* lies as thick as your nail upon the metal you gild.

7. *To heighten the colour if you think fit.*

Take *argal*, *ſalt*, and *ſulphur* of each what quantity you think convenient, and put to them as much fair *water* as will juſt cover the thing that you put into it to be gilded; boil them over the fire, and having ty'd the gilded piece to a ſtring, put it into the boiling liquor for a little ſpace, viewing it every minute; and when it has obtain'd a colour according to your mind, put it immediately into cold water, and it is done.

Another way to heighten the colour of gold.

Take *nitre*, *ſal-armoniack*, *ſandever*, *verdegreaſe*, *white* and *green vitriol* of each a like quantity, grind them with *white wine vinegar*, which lay over all your work; then lay it on a fire, and give it a ſmall heat, that it may ſmoak, and ſo take it off and quench it in urine.

Another way to gild ſilver, braſs, &c.

Firſt cleanſe the metal with *aqua fortis*, then quicken your work with *Mercury*, then take off the *gold amalgamated* as before directed, and lay it on with a ſmall knife, ſpreading it every where, and do in all things as before directed.

To ſilver over braſs or copper plates, as clock-makers do their dial-plates.

Procure either leaf or burnt *ſilver*, and put to it as much *aqua fortis* as will cover it, let it ſtand an hour or two; then decant off the *aqua fortis* as clean as may be, waſh the *ſilver* three or four times in fair water; and then let it dry, and then mix with it, one part of fine *argal* to three parts of the *ſilver*, with a little fair *water*.

When you uſe this, rub it on the work with a cork, till it is ſilvered all over, and lies very fair, and afterwards dry it well with a linen cloth, and warm it; then waſh it over three or four times with the beſt white *varniſh*, which will preſerve it from *tarniſhing*, and other injuries of the weather.

To gild braſs, copper, iron or ſteel, with leaf ſilver or gold.

If you would gild *braſs* or old *iron*, firſt cleanſe it very well with a *wire bruſh*; but if it is new *iron* or *ſteel*, firſt make it very ſmooth, and hatch it all over very neatly with a *hatching knife* (which is a knife with a ſhort blade and a long handle).

Then give it an heat on a charcoal fire, ſo as to make it look *blue*, take it from the fire and lay on the *gold* or *ſilver*, and burniſh it down a little with a blood-ſtone or burniſher; and then give it the ſame heat again, and burniſh it all over.

This work of *Gilding* may be repeated ſix, eight, or ten times, ſtill obſerving to give it the ſame heat, before you lay on the *gold* and *ſilver*, and then burniſh it as before directed.

To GILD *on* WOOD *or* STONE.

Beat in a mortar and grind together *bole-armoniac* and *oil* of *behn*, of each a ſufficient quantity, with this ſmear the *wood* or *ſtone*, and when it is almoſt dry, lay on the leaf *gold*; let it dry and poliſh it.

To GILD *with leaf* GOLD.

Grind leaves of *gold* with a few drops of honey, to which add a little *gum water*, and it will be excellent to write or paint with.

To GILD *ſo as it ſhall not rot out with any water.*

Take calcin'd *oker* and *pumice-ſtone* of each a like quantity and a little *tartar*, pound them with *linſeed-oil* and five or ſix drops of *varniſh*, ſtrain all through a linen cloth, and with this liquor you may imitate *Gilding*.

To

To GILD PAPER.

Grind *bole armoniack* with rain water, and give one laying of it; being dry, take *glair* of *eggs*, and add to it a little ſugar-candy and *gum-water*, which lay over the former, and upon this (when it is in a fit dryneſs) lay on either leaf *ſilver* or *gold*.

CLAUDIO GILLE of *Lorrain*, was born in the year 1600, ſcholar of *Auguſtino Taſſo*, liv'd at *Rome*, excell'd in hiſtory, died in 1682, aged eighty-two.

The GILLIFLOWER. To PAINT there are many ſorts of *Gilliflowers*, as *white*, *yellow*, *purple*, ſtrip'd, ſtreak'd or variegated with ſeveral colours.

For *white* ones cover with *white* and ſhade with *black*, and a little *indigo*, for the heart of the leaves.

For the *yellow* ſort uſe *maſticote*, *gambooge* and *gall-ſtone*.

For the *purple* ſort uſe *purple* and *white*, finiſh with leſs *white*, making them brighter in the heart, and alſo ſomewhat yellowiſh.

For the red ſort, uſe *lake* and *white* and finiſh without *white*.

For the ſtrip'd and variegated ſort, lay on *white* and variegate ſometimes with a *purple*, in which *ultramarine* predominates, or ſometimes with a *purple* in which *carmine* prevails or *lake*; ſometimes with *white*, and at other times without it, ſhading the reſt of the leaves with *indigo*.

The ſeed of them all is to be done with *verditer* and *maſticote*, finiſh'd with *iris*.

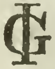
The leaves and the ſtalks are to be done with the ſame *green*, mix'd with *iris* to ſhade with.

To make GILLIFLOWERS *grow double of any ſeed.*

Put the ſeed of a ſingle *Gilliflower* into a *bean*, that the ſprout or ſpire is taken from, ſo that the *bean* may not grow; ſtop the hole cloſe with ſoft *wax*, and ſet the *bean* into convenient fat mould, and the *Gilliflower* ſeed, as the *bean* rots, ſpringing up, will produce double flowers, large and beautiful.

To make PINKS *and* GILLIFLOWERS *blue and purple.*

Slit a *ſuccory root*, and place the root of your flower; then ſet it in a convenient bed, and cover it with light mould, and the ſeed drawing a virtual nouriſhment from that root, when the *pink*, &c. grows up, it will produce a blue flower.



JACINTO GIMINIANI of *Piſtoja*, ſcholar to *Peter da Cortona*, us'd this mark.

GIOTTO, born in the year 1276, diſciple of *Cimabue*, liv'd at *Florence*, excell'd in hiſtory, ſculpture and architecture, died in the year 1336, aged ſixty years.

GIO PORTO, afterwards call'd GIOSEPPE SALVIATI, born in the year 1526 or 1533, ſcholar of *Franceſco Salviati*, liv'd at *Venice*, excell'd in hiſtory painting, and died aged fifty years.

LUCA GIORDANO, call'd LUCAFA PRESTO, born in the year 1626, ſcholar of *Spagnolet* and *Peter de Cortona*, liv'd at *Florence*, *Naples* and *Madrid*, excell'd in hiſtory, died in the year 1694, aged ſixty eight years.

GLADIOLA. To colour this flower lay on *columbine lake* and *white* very pale; then proceed and finiſh with *lake* only, very bright in ſome places and very deep in others, always adding *biſtre* to it for the ſtrongeſt ſhades; let the *green* be *verditer* and ſhade with *iris*.

GLASS. A tranſparent, brittle, factitious body, produc'd of *ſalt* and *ſand* by the action of fire; of which ſome learned authors have given us the following characters or properties.

1. That *Glaſs* is an *artificial concrete* of *ſalt* and *ſand* or *ſtones*.

2. *Fuſible* by a ſtrong fire.

3. When it is fus'd it is *tenacious* and coherent.

4. It does not *waſte* or *conſume* in the fire.

5. When it is melted it will *cleave* to iron.

6. When it is red hot it is *ductile*, and may be faſhioned into any form; but not malleable, and capable of being *blown* into a hollowneſs, which no mineral is.

7. It is *frangible* when thin without annealing.

8. When it is cold is *friable*.

9. *Diaphanous*, whether hot or cold.

10. It is *flexible* and *elaſtic*.

11. It is *diſſoluble* by *cold* and *moiſture*.

12. It is only capable of being *cut with diamond* or *emery*.

13. It will receive any *colour* or *dye*, both externally and internally.

14. It is not *diſſoluble* by *aqua fortis*, *aqua regia* or *Mercury*.

15. Neither *acid juices*, nor any other matter extract either *colour*, *taſte* or any other quality from it.

16. It will admit of *poliſhing*.

17. It will neither loſe *of weight* or *ſubſtance*, by the longeſt or moſt frequent uſe.

18. It will give *fuſion* to *metals*, and *ſoften them*.

19. It is the moſt pliable thing in the world, and will beſt retain the form that is given it.

20. It is *not capable of being calcin'd*.

21. An open *Glaſs* fill'd with water in the ſummer time will *gather drops of water* on the outſide, ſo far as the water on the inſide reaches; and the breath of a man blown upon it will manifeſtly moiſten it.

22. Little balls fill'd with water, *Mercury* or any other liquor, and thrown into the fire, as alſo drops of green *Glaſs* being broken, will *fly aſunder* with a great noiſe.

23. Neither wine, beer, or any other *liquor* will make it *muſty*, or *change its colour* or *ruſt* it.

24. A drinking *Glaſs* partly fill'd with water, and rubb'd on the brim with a wet finger, *will yield beautiful notes*, higher or lower as the *Glaſs* is more or leſs full, and will make the liquor friſk and leap.

The materials us'd in the compoſition of *Glaſs*, as has been obſerv'd, are *ſalt* and *ſand* or *ſtone*.

The *ſalt* is of the fix'd kind, ſuch as will not evaporate with the moſt intenſe heat; the *ſand* or *ſtone* muſt be ſuch as will melt eaſily, this is what gives firmneſs and conſiſtence to the *Glaſs*.

1. This *ſalt* is procured chiefly from a kind of *aſhes*, call'd *polverine* or *rochetta*, brought from the *Levant*, and particularly from *Alexandria* and *Tripoli*.

The *aſhes* are made of a vegetable growing in great abundance in the country, commonly call'd *Kali*, and alſo *Soda* and *Saltwort*, from its ſaline taſte, and alſo *glaſs-weed*, from the uſe made of its *aſhes* in making *Glaſs*.

To get the *ſalt* from this *polverine*, they pulverize and ſift it very fine; then boil it in a braſs copper, with fair water and *tartar*, till a third part of the water is conſum'd, taking care to ſtir it from time to time.

Then filling up the copper with freſh water, they boil it a ſecond time till half be conſum'd; when this has been done, there remains a *lee* impregnated with *ſalt*. To get the *lees* from the *ſalt*, they boil them, till the *ſalt* ſhoots at the top, which they ſcum off as it riſes; an hundred pounds of *aſhes* this way uſually yields eighty or ninety of *ſalt*.

When the *ſalt* is dry they beat it groſly, and put it into a furnace to dry it farther with a gentle heat. When it has been ſufficiently dried, they pound and ſift it very fine, and lay it by to make frit. See FRIT.

But you muſt alſo take notice, that beſides the *aſhes* of *kali*, thoſe of *fern* will alſo yield a *ſalt*, which will make excellent *Glaſs*, in nothing inferior to that of *polverine*.

The method of preparing the *aſhes* of *fern* is the ſame as that of thoſe of *kali*.

The *aſhes* alſo of the *cods* and *ſtalks* of *beans*; as alſo of *coleworts*, *bramble-buſh*, *millet-ſtalks*, *ruſhes* and many other plants may be us'd for the ſame purpoſe.

2. As for *ſtone*, which is the ſecond ingredient in *Glaſs*, the beſt of which is that which will melt, is white and tranſparent. This

ſort of *ſtone* is found chiefly in *Italy* and is call'd *tarſo*, and is a kind of marble; the next is *quocoli* or *cuogele* a ſort of *pebbles*, found at the bottoms of rivers.

Indeed nothing makes finer and clearer *Glaſs* than flint; but the charge of preparing it deters *glaſs-makers* from uſing it; the preparation neceſſary for *ſtone*, is to calcine, powder and ſearce it.

Anthony Neri obſerves, that all white tranſparent *ſtones*, which will not burn to lime, are fit to make *Glaſs*; and that all *ſtones* which will ſtrike fire with ſteel, are fit for making *Glaſs*. But Dr. *Merret* objects againſt this laſt rule as not holding univerſally.

Where *glaſs-makers* cannot eaſily have proper *ſtone*, they make uſe of *ſand*, the beſt for the uſe is that which is white and fine; for green *Glaſs* that which is harder, and more gritty.

The preparation that it needs is only waſhing it well.

Maidſtone in *Kent* furniſhes our *glaſs-houſes* with white *ſand* for their cryſtal *Glaſs*, and with the coarſer for green *Glaſs*.

The method of making white and CRYSTAL GLASS.

There are three ſorts of furnaces us'd in making *Glaſs*, the one to prepare the *frit*, call'd the *calcar*; a ſecond to work the *Glaſs*; and a third call'd the *leer*, to anneal it. See the article FURNACE.

For the making *cryſtal Glaſs*, take of the whiteſt *tarſo* pounded ſmall, and ſearced as fine as flower, an hundred pounds to *polverine* ſixty five pounds.

Mix them well together, and put them into the furnace call'd *calcar*, firſt heating it. Keep a moderate fire for an hour continually ſtirring the materials, that they may incorporate and calcine together.

Afterwards increaſe the fire for five hours; after which take out the matter, which being now ſufficiently calcin'd is call'd *ſalt* of *frit*, which is alſo call'd *bollito*.

Take the *frit* out of the *calcar*, lay it up in a dry place, keep it cover'd from the duſt; and let it lie for three or four months.

To make the *Glaſs*, take of this *cryſtal frit*; ſet it in pots into the furnace, adding to it a proper quantity of *manganeſe*, (See MANGANESE) when they are both fus'd or melted, caſt the fluor, (*i. e.* the melted matter) into fair water, to purify it from the *ſalt* call'd *ſandever*, which if not cleared from it, would make the cryſtal obſcure and cloudy.

This lotion or waſhing muſt be repeated ſeveral times, till the cryſtal is fully purg'd.

When this has been done, let it boil for four, five, or ſix days; then try whether it has had *manganeſe* enough, and if it look ſtill greeniſh, add more *manganeſe*, by little and little at a time with diſcretion; but be ſure to take care not to overdoſe it, becauſe the *manganeſe* inclines it to a blackiſh hue.

Then let the metal clarify till it becomes of a clear and ſhining colour; which when it comes to, it is fit for blowing or to be form'd into veſſels at pleaſure.

There are three principal kinds of *glaſſes*, diſtinguiſhed by the form or manner of working them, *viz*, 1. Round *Glaſs* as theſe of our veſſels, phials, drinking *glaſſes*, &c. 2. Table or *window-glaſs*, of which there are various ſorts, *viz. crown-glaſs*, *jealous-glaſs*, &c. and *plate-glaſs* or *looking-glaſs*.

The method of working or blowing ROUND GLASS.

The working furnace being round has ſix *boccas* or apertures; at one of which call'd the great *bocca* the furnace is heated, and the pots of *frit* ſet in the furnace; two other ſmaller holes call'd *boccella's*, ſerving to lade or take out the melted metal, at the end of an iron to work the *Glaſs*. At the other holes are put in pots of other fuſible ingredients to be prepar'd, and at laſt emptied into the lading pot.

There are to be ſix pots in each furnace, all made of tobacco-pipe clay, proper to ſuſtain not only the heat of the fire, but alſo the violent effects of the *polverine*, which penetrates every thing elſe.

But two of theſe pots are wrought at, the reſt ſerving to prepare the matter for them.

The fire of the furnace is made and kept up with dry hard wood, caſt in without intermiſſion at the ſix apertures. This is never omitted, even upon the moſt ſolemn days.

When the matter contain'd in the two pots is ſufficienly vitrified, then they are wrought, by taking out the metal, blowing and faſhioning it.

The metal having been now ſufficiently refin'd, the operator or ſervitor takes his blowing iron, which is a hollow tube about two foot and a half long, or longer, and dipping it in the melting pot, there turns it about; and the metal ſticks to the iron, like ſome glutinous or clammy juice, much like, but more firmly than *Venice* treacle.

For each *Glaſs* he dips four times, and at each dip rolls at the end of his inſtrument, with the *Glaſs* upon it, on a piece of iron, over which is a veſſel of water; the coolneſs whereof helps to conſolidate the *Glaſs* more readily, and diſpoſes it the better to bind with the next to be taken out of the pot; when the operator has dipt the fourth time, and there is now metal enough upon the blowing iron, he blows gently through the iron, by which he raiſes or lengthens it nearly a foot, after the manner as is done by blowing in a bladder or globe; and to give it a poliſh, he rolls it to and fro on a ſtone.

Then he blows again a ſecond time, and thus forms the bunch or belly of the *Glaſs*. The matter by this ſecond blaſt aſſumes the figure of a gourd or callebaſh eighteen or twenty inches in diameter.

As often as the operator blows into the iron (which muſt be very often) he removes it haſtily from his mouth to his cheek, leſt he ſhould draw the flame into his mouth, when he applies it again to the iron.

Then he whirls the iron many times round his head to lengthen and cool the glaſs; ſometimes the *Glaſs* being thus blown round is return'd to the fire, where it flattens a little of itſelf, when flatted it is taken out and cooled; and if it be requir'd as to the form intended, the workman flattens the bottom a little, by preſſing it on the marble, or he moulds it in the *ſtamp-irons*; and thus delivers it to the maſter workman to break off the *collet*.

The *collet* or neck is the narrow part which clove to the iron: to ſet the *Glaſs* at liberty they put a drop of cold water on the *collet*, which by its coldneſs cuts or cracks a quarter of an inch; after which by giving it a ſlight knock, the fracture is communicated all round the *collet* it drops off; the waſte piece of *Glaſs* is knock'd off the iron and thrown by to make green *Glaſs*.

This being done the iron-rod or *ponteglo* is dipt into the melting pot, and with the matter that ſticks thereto, they apply and faſten it to the bottom of the veſſel, oppoſite to the *collet*.

The veſſel thus ſuſtain'd by the iron-rod is carried to the great *bocca* to be heated and ſcalded, and while another perſon takes care thereof the former operator reſts, and prepares himſelf for the *branching*.

The *branching* is making the bowl; to do this they thruſt in an iron inſtrument call'd *paſſago*, and augment and widen the aperture opened thereby with the *procello*.

In turning this inſtrument about to form the bowl, the edge becomes thickned, the glaſs being as it were doubled in that part; whence the hem obſerv'd on the circumference of our *glaſſes*. What is ſuperfluous they cut off with ſhears.

The veſſel being thus opened is return'd to the great *bocca*, where it is ſufficiently heated a ſecond time; and then the operator gives the bowl its finiſhing, by turning it about with a circular motion; which it increaſes in proportion as the bowl opens, and enlarges by means of the heat and agitation.

The *Glaſs* being thus finiſh'd is carried from the *bocca*, ſtill being turn'd round to a kind of earthen bench covered with brands or coals extinguiſh'd, here they let it cool a little, and come to its conſiſtence; having firſt ſeparated it from the iron-rod by a ſtroke or two with the hand.

Thus by *blowing*, *preſſing*, *ſcalding*, *amplifying* and *cutting* the *Glaſs* is brought into the form that the workman had firſt deſign'd in his mind.

When a number of them has been finiſh'd by the maſter, and if the veſſel requires it, he puts on a foot and handles, *&c.* and with the *ſpici* puts on rigarines and marblings. Then a ſervitor takes them in an iron fork, and places them in the tower of the *leer* to anneal and harden.

What has been here ſaid of white or *cryſtal Glaſs*, is the ſame as to the making of common or green *Glaſs*, the working part being the ſame in all, the difference being in the *polverine* or *ſalt* made uſe of.

So many maſters as there are, ſo many pots, at the leaſt, and ſo many *bocca's* there muſt be, each man having his proper ſtation; where, ſays Dr. *Merret*, they receive thoſe ſcorching heats, ſallying directly into their faces, mouths and lungs; whence they are forc'd to work in their ſhirts, with a ſtraw broad brim'd hat on their heads, to defend their eyes from the exceſſive heat and light. They ſit in large wide wooden chairs, with two long elbows, to which their inſtruments are hung.

They work ſix hours at a time, meaſured by a ſingle *Glaſs*; after which they are reliev'd by others, for the like time, ſo that the furnaces are never idle.

The method of working or blowing WINDOW *or* TABLE GLASS.

The method of making crown window glaſs, now practiſed in *England*, is ſaid to have been borrowed from the *French*.

An *Engliſh* glaſs-maker going over, wrought in *France* on purpoſe to let himſelf into the ſecret; which when he had attained to, he came back, and ſet up a glaſs-work, wherein he far excell'd the *French* his teachers.

This glaſs is blown much after the ſame manner as looking glaſs, as follows:

The furnace, melting pots, materials, and fire are the ſame for *window* and *table* glaſs as for *round* glaſs; and the difference in the operation only begins after the ſervitor has dipt his blowing iron the fourth time in the melted metal.

The glaſs then being in this ſtate, is blown; but inſtead of rounding or forming it into a bunch, the particular motion the workman gives it in the directing and managing the wind, and the way of rolling it on the iron, makes it extend in length two or three foot, and form a cylinder which at firſt is but two inches diameter; but which by being apply'd to the fire again, and blown afreſh after taking out, becomes of the extent required for the table glaſs to be form'd; but with this circumſtance, that the ſide which is faſtened to the iron goes gradually diminiſhing, and ends in a kind of cone or pyramid.

To render the two ends nearly of the ſame diameter, after adding a little glaſs to that oppoſite to the iron, they draw it out with a pair of iron pinchers.

Then they cut off the ſame end with a little water, and carrying the cylinder back to the *bocca*, they incide it likewiſe with water in two other places; one eight or ten inches from the iron, and the other the whole length.

Both the extremities of the glaſs cylinder being thus taken off, it is heated on a kind of earthen table ſomewhat rais'd in the middle, in order to promote its opening at the place incided or cut lengthways.

In this the workman makes uſe of an iron, wherewith he alternately lowers and raiſes the two ſides or halves of the cylinder, which now begin to open and unfold like a ſheet of paper, and at length grow perfectly flat.

The table of glaſs is now in its laſt perfection, and needs nothing farther but to be heated over again; which when it is taken out, it is laid on a table of copper, where it having lain till it has cool'd and come to its conſiſtence, it is carried on forks to the tower of the furnace, where it is ſet to anneal for twenty-four hours.

Formerly the tables were ſet into the the annealing tower in great numbers, perhaps an hundred at a time in a perpendicular ſituation, which was the occaſion that thoſe ſet in firſt, bearing in ſome meaſure the preſſure of all the laſt, were bent, and thus rendered unfit for uſe; but a way has been ſince found out to remedy this inconvenience by ſeparating them into tens, with an iron ſhiver, which by dividing the weight, diminiſhes it, and by that means preſerves the tables as flat as when they went in.

Of the different ſorts of table or window GLASS.

There are divers ſorts of this glaſs made in divers places for the uſe of building.

Crown Glaſs of which there are two kinds, diſtinguiſhed by the places where they are wrought, *viz.*

1. *Ratcliff* or *Cock-hill crown glaſs*, which is the beſt and cleareſt, and was firſt made at the *Old Bear-Garden* at the *Bank-Side*, *Southwark*. Of this there are twenty-four tables to the caſe, the tables being of a circular form, about three foot ſix inches in diameter.

2. *Lambeth crown Glaſs*, which is of a darker colour than the former, and inclining to green.

French Glaſs, call'd alſo *Normandy Glaſs*, and formerly *Lorrain Glaſs*, becauſe made in thoſe provinces. At preſent it is made wholly in the nine glaſs-works in *France*, of which five are in the foreſt of *Lyons*, and four in the county of *Eu*, the laſt at *Beaumont*, near *Rouen*. This is of a thinner kind than our crown glaſs, and when laid on a piece of white paper, appears of a dirtyiſh green colour. There are but twenty-five tables to the caſe.

German Glaſs is of two kinds, *white* and *green*; the firſt is of a whitiſh colour, but ſubject to thoſe ſmall curved ſtreaks, obſerved in our *Newcaſtle Glaſs*, tho' free from the ſpots and blemiſhes thereof. The green, beſides its colour, is liable to the ſame ſtreaks as the white, but both of them are ſtraiter and leſs warp'd than our *Newcaſtle Glaſs*.

Dutch Glaſs is not much unlike our *Newcaſtle Glaſs*, either in colour or price. It is frequently much warp'd like that, and the tables are but ſmall.

Newcaſtle Glaſs is what is moſt us'd in *England*. It is of an aſh colour, and ſubject to ſpecks and ſtreaks and other blemiſhes, and beſides is frequently warp'd. There are forty-five tables to the caſe, each containing five ſuperficial feet; but ſome ſay thirty-five tables, and ſix foot in each table.

GLASS *to join*. Quench unſlack'd *lime* with *wine*, and pound it to a fine powder; mix with it *figs* and *ſwine's greaſe*, and afterwards work them well together. This will join broken pots or any thing together. Or,

Take *Greek pitch*, *roſin*, and the powder of little ſtones; mix theſe, and heat them over the fire, and you may join any thing with them. Or,

Take froth of glue, call'd *ſpuma ferri*, a quarter of a pound, *tile ſhards* powdered half a pound, of unſlack'd *lime* one pound, and as much linſeed oil as will mix and work them together. This glue neither yields to water nor fire.

To tinge GLASS *of a deep red*.

Opake colours have a body, but the tranſparent ones none; for which reaſon this deep red muſt be mix'd with matters that give it one, as ſhall be ſhewn.

Take twenty pounds of *cryſtal frit*, one pound of pieces of *white glaſs*, and two pounds of calcin'd *tin*; mix the whole well together, and put it into a pot, and ſet it in a furnace that it may purify.

When it is melted, caſt in an ounce of *calcin'd ſteel* well pounded, and an ounce of ſcales of *iron* from the anvil well pulveriz'd and mixt together, and keep ſtirring the glaſs well with an iron ſtirrer, while you are putting in the powder, to hinder it from riſing too much.

You muſt take care not to put in too much of the powder, for that would make the glaſs black, whereas it ought to be clear, ſhining, and of an obſcure yellow colour.

Then take about ſix drams of calcin'd *copper* prepar'd, caſt it upon the melted glaſs, often mixing it two, three or four times, and the glaſs will be as red as blood.

If the colour be as you would have it, you muſt work it off preſently, for fear it ſhould turn black, and the colour be loſt, of which great care muſt taken.

But if notwithſtanding this the colour comes to be loſt, you muſt add more ſcales of *iron* in powder, and it will return.

To make a PEACH *colour in* GLASS.

To make this colour, which is a very agreeable one, take glaſs prepar'd and ting'd of a milk white, and when it is in good fuſion, put in ſome *manganeſe* of *Piedmont* prepar'd, and that by little and little, ſtirring the matter well at each time, till the colour becomes as fine and perfect as you deſire it; but you muſt work the glaſs in time, otherwiſe the colour will be loſt; but by ſo doing, you will have a very fair peach-colour.

To make a GOLD *yellow in* GLASS.

Gold colour being one of the moſt noble and fineſt we can make, by reaſon of its imitating the moſt perfect metal in nature, muſt be made with the pureſt materials and greateſt precaution.

Take two parts of *cryſtal frit*, made with *tarſo*, and not with *ſand*, which is not ſo good, and one part of *frit* compos'd of two thirds of *tarſo*, and one third of fine ſalt of *polverine* prepar'd; pound and mix them well, and to each fifty pounds of this compoſition, add half a pound of *tartar* purified, pounded, and ſearced fine, and half a pound of *manganeſe* of *Piedmont* prepar'd, mixing theſe powders well with the two *frits*, becauſe you muſt not caſt them on the melted glaſs as in other colours. Then put the whole by little and little into a pot, and ſet them in a furnace, in which let them ſtand at an ordinary fire four days, for fear the *Glaſs* riſing ſhould run over.

When that matter is well purified, you may uſe it for making veſſels, and what other works you pleaſe, which will be of a fair colour.

If you would have the colour yet clearer, you muſt add more powder, and you will have a very fine golden colour.

If you would have it yet finer, take fine cryſtal *frit* made of *polverine* of *rochetta*, and the golden colour will be yet more fair.

To give GLASS *the colour of* LAPIS LAZULI.

Lapis Lazuli, which is a fine blue, and full of veins of gold, will not be eaſy to imitate, without a great deal of care and induſtry in its preparation.

To make this fine colour, you muſt uſe the ſame matter as for the fine white; and when it is in fuſion in the pot, you muſt add to it by little and little, the *blue enamel* in powder, which is made uſe of by painters, mixing the whole well together each time, and that as often as there is occaſion to make this colour.

Then try it, whether the colour is to your mind, and when it is, let it ſtand for full two hours, and make a ſecond eſſay of it; if the colour be perfect, let it ſtand ten hours, and then mix it again.

If it keeps in the ſame eſtate without changing the colour, you may employ it in making what veſſels you pleaſe, which will be of the true colour *of Lapis Lazuli.*

If in working this glaſs it hapens to riſe, you may caſt in a little *leaf gold*, which will make the glaſs approach yet nearer to *Lapis Lazuli*, and which will in a moment ſtop the riſing of the metal, as ſugar will do in boiling oil.

To make a MILK WHITE *colour in* GLASS.

To make the milk white colour well, requires no leſs exactneſs than the *blue.*

To ſucceed in it, take twelve pounds of good cryſtal frit, two pounds of calx of *lead* and *tin*, one of each, and half an ounce of *mangane ſe* of *Piedmont* prepar'd; the whole being pulveriz'd and mixt together, put them into a pot heated in the furnace; let it ſtand there for twelve hours, then mix the whole well and make an eſſay of it.

If the colour don't pleaſe you, add to it ſome *calx* of the two metals beforementioned, which incorporate with the glaſs, mixing it well. In eight hours time after the glaſs will be fit to work, and white as milk.

Another fairer and whiter colour.

This ſecond way of giving a milk white colour to glaſs is much better than the precedent, and the work more exquiſite.

We only make uſe of calx of *tin*, without mixing any *lead*, and we put fifteen pounds of that *calx* to a hundred pounds of pure *cryſtal frit*, with twelve ounces of *mangane ſe* of *Piedmont* prepar'd; the whole being well pulveriz'd and mix'd, put it into a pot heated in the furnace, there to purify during eight days.

Then caſt the matter into water, the better to purify it; then after it has been dry'd, put it into the ſame pot to be melted again.

If it be tranſparent, you muſt add three pounds twelve ounces of the ſame calx of *tin* as before, mixing it well with the melted metal, to make it the better incorporate; and in twenty-four hours it will be finer and whiter than ſnow, and fit to be wrought.

To make common GLASS *become white and* CRYSTALLINE.

If you put in a convenient pot *frit* of *polverine*, you will have a common *white glaſs.*

If you add *ſalt* of *rochetta* to this *fritt*, you will have a very fair *cryſtal glaſs*, which will be between *ordinary glaſs* and *cryſtal.*

To make it very fine, you muſt add the ſame doſe of *manganeſe* of *Piedmont* prepar'd as for *cryſtal*; for the *manganeſe* takes away all greenneſs in the glaſs, and makes it very white.

If you would have a very fine glaſs, you muſt always caſt the cryſtalline matter into water; you may alſo do the ſame by common glaſs to bring it to perfection.

When this has been done, put the matter into the pot again, and when it is melted, put it again into water, repeating this till it be purified and made fine.

To have glaſs finer than ordinary, this caſting of it into water muſt be very exactly obſerv'd; for beſides its whitening, it is there calcin'd and purified, and has fewer bliſters and puſtles.

But to raiſe the matter to the greateſt perfection, mix fifty pounds of *cryſtalline glaſs*, and as much common, and put to it ten pounds of purified ſalt of *tartar*; that will give a *glaſs* and *cryſtal* more than ordinary fine, provided you always take care not to mix it with the *collets* of the glaſs, which has touch'd the iron rod; for they always make the glaſs blackiſh, and are only fit for green glaſs.

To make marble colour in GLASS.

White marble being very ſimple, it is eaſy to imitate; the way of doing it only requires *cryſtal frit*, which muſt be wrought as ſoon as it is melted, before it be purified, for ſo it will give a very fair marble colour.

The following account of the colours for painting on GLASS *we have from the celebrated M.* Felibien.

For BLACK. Take two thirds of flakes or ſcales of *iron*; beat them up, and mix them with one part of *rocaille*, or little glaſs beads.

For an azure BLUE. Proceed as in the *green*, only leaving out the *æs uſtum*; inſtead of it, uſe *ſulphur.*

For CARNATION. Uſe *feretto* and *rocaille.*

For colours of HAIR, TRUNKS *of trees*, &c. Take *feretto*, *rocaille*, &c.

For GREEN. Take *æs uſtum* one ounce, *black-lead* the ſame quantity, and four ounces of *white-ſand* incorporated by fire; to which, after calcination, add a fourth part of *ſalt-petre*; then calcine again, adding a ſixth part more; after which it is uſual to give it a third coction before it is uſed.

For PURPLE. Proceed as in the *green*, only leaving out the *æs uſtum*, and inſtead thereof uſe *perigueux.*

For RED. Take *litharge* of *ſilver*, and *ſcales* of *iron*, *gum arabick*, *harderia*, *glaſs beads*, and *blood ſtone* nearly in equal quantities. This is one of the moſt difficult colours, and the preparation is not to be learn'd but by experience.

For VIOLET. Proceed as for *green*, but leaving out the *æs uſtum*, and inſtead of it uſe both *ſulphur* and *perigueux.*

For WHITE. Take *ſand* or little white *pebbles*, calcine them, pound them in a mortar, and afterwards grind them on a marble with one fourth part of *ſalt-petre* added to them; calcine the mixture, and pulverize it over again, and when you are ready to uſe it, add a little *gypſum* or *plaiſter of Paris*, &c.

For YELLOW. Grind *leaf-ſilver*, mix it up in a crucible with *ſulphur* or *ſalt-petre*; then having well beaten or ground it on a porphyry ſtone, afterwards grind it over again with nine times the quantity of *red oker.*

PAINTING *or* STAINING GLASS.

The antient or primitive manner of painting glaſs was very ſimple, and conſequently very eaſy; it conſiſted in the mere arrangement of pieces of glaſs of different colours in ſome ſort of ſymmetry; and conſtituted what is now call'd MOSAIC work.

In proceſs of time they came to attempt more regular deſigns, and alſo to repreſent figures heightened with all their ſhades; yet they proceeded no farther than the drawing the contours of the figures in black with water, and hatching the draperies after the ſame manner on glaſſes of the colour of the object they deſigned to paint.

For the *carnations*, they us'd glaſs of a bright red colour, and upon this they drew the principal lineaments of the face, *&c.* with black.

But in time the taſte for this ſort of painting improving conſiderably, and applying the art to the adorning of churches, baſilicks, *&c.* they found out means of incorporating the colours in the glaſs it ſelf, by heating them in the fire to a proper degree, having firſt laid on the colours.

The firſt notion of this is ſaid to have been given by a *French* painter of *Marſeilles*, after he had been at *Rome*, under the pontificate of *Julius* II. But the firſt who carried it to any heighth were *Albert Durer* and *Lucas Van Leyden.*

The colours us'd in painting or ſtaining of glaſs are very different from thoſe us'd in painting either in water or oil colours.

In the windows of antient churches, *&c.* there are to be ſeen the moſt beautiful and vivid colours imaginable, which far exceed any of thoſe us'd by the moderns; not ſo much becauſe the ſecret of making thoſe colours is intirely loſt; as that the moderns won't go to the charge of them, nor be at the neceſſary pains, by reaſon that this ſort of painting is not now ſo much in eſteem as it was formerly.

Thoſe beautiful works which were made in the glaſs-houſes were of two kinds.

In ſome the colour was diffus'd through the whole ſubſtance of the *glaſs*; in others, which were the more common, the colour was only on one ſide, ſcarce penetrating even the ſurface more than one third of a line, tho' this was more or leſs according to the nature of the colour, the yellow being found always to enter the deepeſt of any colour.

Theſe laſt, though not ſo ſtrong and beautiful as theſe mentioned before, were of more advantage to the workmen, becauſe that they could on the ſame glaſs, tho' already coloured, ſhew other kind of colours, where there was occaſion to embroider draperies, inrich them with foliages, or repreſent other ornaments of gold, ſilver, *&c.*

In order to this, they made uſe of *emery*, grinding or wearing down the ſurface of the glaſs, till ſuch time as they were got thro' the colour to the clear glaſs; this done, they apply'd the proper colours on the other ſide of the glaſs.

By this means the new colours were hindred from running and mixing with the former, when they expos'd the glaſſes to the fire as will appear hereafter.

When the intended ornaments were to appear *white*, the glaſs was only bared of its colour with *emery*, without tinging the place with any colour at all; and this was the manner by which they wrought their lights and heightenings on all kinds of colours.

The firſt thing to be done, in order to paint or ſtain glaſs in the modern way, is to deſign and even colour the whole ſubject on paper.

2. To chuſe pieces of glaſs proper to receive the ſeveral parts.

3. To divide or diſtribute the deſign itſelf or papers it is drawn on into pieces ſuitable to thoſe of the glaſs, always taking care that the glaſſes may join in the contours of the figures, and the folds of the draperies.

4. To order them ſo that the carnations may not be impair'd by the *lead*, with which the pieces are to be join'd together.

5. Having made the diſtribution, take care to mark all the glaſſes as well as papers, that they may be known again.

6. Then applying each part of the deſign upon the glaſs intended for it to transfer the deſign upon the glaſs with the black colour diluted in *gum water*, by tracing and following all the lines and ſtrokes, as they appear thro' the glaſs with the point of a pencil.

7. Then the glaſſes muſt be ſet by till they are thoroughly dry, which will be in about two days; then the work being in black and white, is to have a ſlight waſh over with *urine, gum arabick*, and a little *black*, and repeated ſeveral times, according

as the ſhades are deſired to be heightened, with this precaution, never to apply a new waſh till the former is ſufficiently dried.

This done, the lights and riſings are given by rubbing off the colour in their reſpective places, with a wooden point or the handle of the pencil.

Then having all your colours in a readineſs, fill your pieces with colours, for which uſe the nib of the pencil, eſpecially in carnation, where you muſt be very exact; you muſt alſo be very circumſpect and expeditious, and take a great deal of care not to blot or blur the tracings, and chooſe rather to paint on the other ſide of the glaſs.

All the colours, except yellow, may be applied on the ſame ſide, and that you muſt do on the contrary ſide, becauſe it is apt to mingle with the other colours, and if near the blue. will compoſe a green; ſo that for want of ſuch precaution, the whole work may be ſpoil'd; if the yellow tranſmit it ſelf perfectly through the quarre, it is as well as if it had been done on the ſame ſide; and take notice by the way, that the other colours have not ſo ready a tranſition, becauſe they conſiſt of a groſſer body.

The yellow ought to be very equally and juſtly laid on in a greater or leſſer quantity, as you would have your ſhadows; obſerve this too in the reſt, eſpecially to lay them on as quick as poſſible, as we have already ſaid, particularly the azure green and purple require the moſt exactneſs of any.

Now to ſet off and heighten the lights, in piling a beard, deſcribing hair in drapery, or otherwiſe, uſe the handle or butt end of the pencil, a ſmall pointed ſtick or quill, wherewith take off the colours in thoſe places you would enlighten, which is eaſily done.

Such works as are done in griſaille, you muſt paint after this manner: trace your piece with black, and let it dry for two days intirely; do it over very lightly and equally with a waſh ſo thin laid on as not to efface the firſt lines, and let it dry for two days; after this, run them over again with the ſame waſh where you find it convenient to give a ſecond tinge, and let it dry two days longer; then to give it the lights and convenient heightening, take the ſharp butt end of your pencil or pointed ſtick or pen as before, and take off the colour of the firſt waſh in the moſt neceſſary places, and ſo your work will be finiſhed.

To make this waſh is eaſy; take a ſmall pewter cup or other veſſel, and put therein a quantity of black colouring; then diſſolve *gum arabick* powdered in its weight of wine, throw this on the black in the pewter diſh or ſawcer, that it may be very clear and not eaſily dryed, and that you may have your waſh for painting glaſs in griſaille or gray.

A furnace for painting the GLASS *and ſettling the colours.*

This furnace muſt be ſquare, of good brick, two foot high, and ſo much every way, and have three diviſions; the undermoſt for the aſhes muſt be ſix inches high, the middle one for the fire and to put in the fuel muſt be ſix inches high, and have its opening five or ſix inches broad and four deep, with a good iron grate of three ſquare bars of iron which croſs the furnace and divide it in the middle to ſupport the earthen ſtove hereafter deſcribed; the uppermoſt diviſion muſt be a foot high, with a little opening about the middle before of four inches high, and two wide, to put in and draw out the ware a baking, to ſee if it be well done.

In this uppermoſt diviſion muſt be put the aforeſaid ſtove of good fire-proof crucible earth, the bottom an inch and a half thick, and from thence up to the brim ten inches full; it muſt be ſquare as the furnace, and have two inches room on all ſides, that the fire may flame round about it to bake the work, therefore placed exactly in the middle of the furnace. There muſt be alſo in the fire part of this ſtove, an opening juſt againſt, and of the ſame ſize and form as that of the furnace, for the conveniency of putting the ware in and out.

Take this method of diſtinguiſhing the furnace in all its parts, and to lay down a clearer deſcription thereof, obſerve:

The letter A is the aſh hole for the aſhes that fall from above thro' the iron grate; and note, that the wider the opening is, the more violent the fire will be.

The letter B is the fire place.

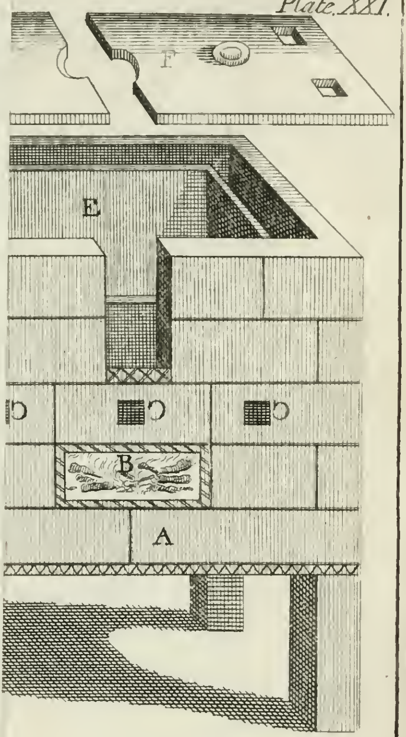
The letters C are the three ſquare iron bars to ſupport the pan for the ware.

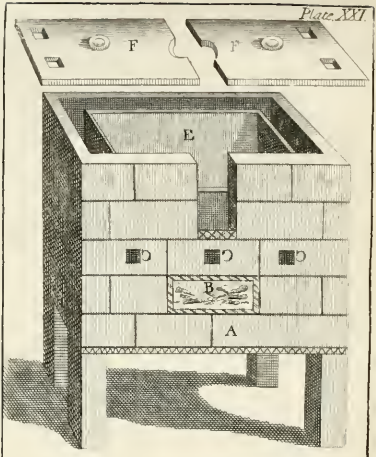
The letter D is the opening of the furnace and pan, through which the ware muſt be conveyed in and out.

The letter E is the earthen pan, wherein all the painted ware muſt be baked.

The letters F are two half lids of potters earth for covering the whole furnace above. As ſoon as the ſtove is full of ware, they muſt be well cloſed and luted together, to prevent the air coming in any where but by the four ſquare holes at both ends of the lid, and the two ſemicircles in the middle, in which make a round hole for a chimney, when the two half lids are cloſed. Theſe five holes are for letting out the ſmoke and flame of the furnace.

Plate XXI.




F
F
E
C
C
C
B
A

To make white ground for painting on GLASS.

Now to purſue our work, we will begin with the preparation of all the colours to be uſed in painting glaſs; for before we proceed to preſcribe the rules how to work, the materials muſt be conſidered.

The white is compounded of ſeveral ingredients; the firſt are ſmall white river pebble-ſtones heated red hot over a fire in an iron ladle, and thrown afterwards into an earthen diſh full of cold water to calcine them; and this muſt be repeated ſeveral times until they be prepar'd; afterwards being dried, pound them with a ſtone or glaſs peſtle in a ſtone mortar, and ſo grind them upon a marble to an impalpable powder; then mix a fourth part of *nitre* with it, and calcine them in a crucible; then pound and grind them again, and calcine them a third time over a ſmaller fire than your former, and ſo take them off for uſe.

This done, when you would paint with it, add equal parts in weight of *gyp*, a ſort of talk found amongſt plaſter mold baked on the coals to a whiteneſs, and reducible to powder, and *rocaille*, (See ROCAILLE) grind them all three well together in a hollow plate of copper with *gum arabick* water. Thus you'll have your white in good condition to paint withal.

To prepare black for painting on GLASS.

As this colour cannot be omitted in any ſort of painting, ſo in this, the manner of uſing it is much the ſame, and the preparation eaſy.

You muſt grind ſcales of iron from the ſmith's anvil-block for three hours on the ſhallow copper baſon or plate; add to this one third of the ſame weight of *rocaille*, with a little calx of *copper*, to hinder the iron from turning red in the fire; grind it to as impalpable a powder as you can bring it to, and ſo keep it in a cloſe veſſel for uſe.

To prepare a yellow paint for GLASS.

This colour requires a more coſtly preparation than the precedent, becauſe it cannot be well done without a tenth part of prepar'd ſilver, as is ſhewn hereafter.

Take fine ſilver in plates or leaves, ſtratify them in a crucible with powder of *ſulphur* or *nitre*, the firſt and laſt lay being of the powder, and ſo calcine them in a furnace; this done, caſt it out as ſoon as all the *ſulphur* is conſumed into an earthen baſon of water, and afterwards pound it in your ſtone mortar until 'tis fit for the marble, and ſo grind it with ſome of its water wherein it was cooled for ſix hours; then add nine times its weight of red *oker*, and grind them together for a full hour and it's done, and fit for painting on glaſs.

To make a blue for painting GLASS.

The whole ſecret of this preparation depends on the calcining the ingredients, and goodneſs of the crucible.

Take two ounces of *zaffer*, two ounces of *minium*, and eight ounces of very fine white ſand; put all theſe into a bell-metal mortar, and pound them very well, and ſo into a crucible covered and luted over a quick fire for an hour; then draw out the crucible, and pound them again as before; this done, add a fourth of its weight in *ſalt-petre* powdered, and having mixt all very well together, return them into a crucible covered and luted, which place again in the furnace for two hours at leaſt, continuing ſuch another fire as the former. The crucible being off, and cooled a ſecond time, grind the maſs as before, and ſo put it into a crucible again, with a ſixth part of *ſalt-petre*, and let it remain on the fire for three hours; then take off the crucible immediately with an iron ſpatula red hot, and take out the matter leſt it ſhould ſtick, being very clammy and hard to be emptied.

'Tis convenient to have ſtrong crucibles for this calcination, becauſe it remains ſo conſiderable a while in the fire, and they muſt be luted with an extraordinary lute, adding powder of *borax* to the powder of glaſs vitrified, which helps the fuſion of the glaſs which we have omitted there; but the greateſt ſtreſs lies in baking the crucible afterwards in a ſmall fire to cement the pores, and make the earth compact as glaſs, which would be very much furthered if you would throw on it a conſiderable quantity of *ſalt* as it comes out of the fire. This would glaze it, and capacitate it for retaining the ſpirits in the fire.

To make a red colour for GLASS *paint.*

This requires as much caution as the blue.

You muſt take ſcales of *iron* and litharge of *ſilver* of each a dram, *feretto* of *Spain* half a dram, *rocaille* three drams and a half; grind all theſe for half an hour on a ſhallow copper plate; in the mean time, pound three drams of *blood-ſtone* in an iron mortar, and add it to the reſt; then pound a dram of *gum arabick* in that mortar to an impalpable powder to take off the remains of the *blood-ſtone*, and ſo add it to the reſt, grinding them ſtill continually, leſt the *blood-ſtone* be ſpoiled.

The beſt manner of grinding theſe is to pour water by little and little on the ingredients as you grind them, neither wetting them too much nor too little, but juſt as much as will keep a good temper, as for painting; afterwards put all into a foot glaſs, and ſo drop on it through a ſmall hollow cane of wood or with your finger, as much water as will bring it to the conſiſtence of an egg's yolk butter'd, or a little more; then cover the glaſs to preſerve it from duſt, and ſo let it ſtand three days to ſettle.

After this, decant the cleareſt and pureſt of the colours that riſe at the top into another glaſs, without diſturbing the ſediment; and two days after it has ſettled anew, pour off again the pureſt of the colours as before.

This done, ſet it in the body of a broken mattreſs or bolthead over a gentle ſlow fire to dry eaſily, and ſo keep it for uſe.

When you have occaſion for it, take a little fair water in a glaſs, and with it, moiſten as much colour as you think convenient; that will be excellent for carnation. As for the *fæces* which are very thick, dry them too, and you may moiſten theſe in like manner with water for drapery, timber colour, and ſuch other as you think convenient.

It is true all painters of glaſs don't uſe theſe colours thus prepar'd, there being few artiſts of that kind, who have not invented their own particular colours, which they eſteem as great ſecrets.

But nevertheleſs they that have been above deſcrib'd are ſufficient for the beſt paintings of all ſorts, provided the workman has but the skill to manage them.

To make a purple colour for painting of GLASS.

The preparation of this purple colour is exactly like that of the blue, for this reaſon we need not uſe any tedious repetitions.

You muſt take an ounce of *zaffer*, and an ounce of very pure and clear *perigueux*, two ounces of *minium*, eight ounces of very fine and white ſand; pound all theſe in a bell-metal mortar, and reduce it to an impalpable powder; put it afterwards into a good crucible well covered and luted in the furnace; keep a very good fire to it for an hour; then draw it out, and as ſoon as it is cold, pound the maſs over again in the ſame mortar; to this add a fourth part of its weight of *nitre*; mix them together, and put them into a crucible, and ſo proceed until you have a fine purple colour.

To make a green paint for GLASS.

The change of the ingredients makes this colour, but the method for incorporating them is the ſame as the former.

Take two ounces of *æs uſtum*, to this add two ounces of *minium*, and eight ounces of very fine white *ſand*; pound theſe together in a metal mortar to an impalpable powder, and put it afterwards in a crucible luted and covered into a wind furnace, giving it a good fire for an hour; after this, draw it off, and let it cool; then pound it again, adding a fourth part of its weight of nitre in powder; grind and mix them well together, putting them afterwards into crucible luted and covered in the furnace for two hours, and then you'll have a very fine green.

Of other colours in general for painting of GLASS.

We have directed how to make the firſt maſter-colours for painting on glaſs; now we proceed to ſhew what other depend on them without enlarging on theſe preparations.

The red ſerves for carnation, but there ought to be one part of *feretto* of *Spain* in the compoſition, and another of *rocaille*; grind theſe on your copper plate, imbibing the powder with gum'd water until it be made fit for uſe.

The red *fæces* there alſo mentioned will ſerve in drapery; and to deſcribe timber work, trunks of trees, hair, brick and ſuch other things, you muſt take an ounce of *feretto* of *Spain* as in the former compoſition, an ounce of *iron ſcales*, and two ounces of *rocaille*; grind them together on the copper plate, moiſtening them with *gum water* till they be brought to a proper conſiſtence, neither too thick nor too thin; ſo you'll have a red inclining to a dark yellow, very fit for uſe.

There be ſeveral more made uſe of in this, as well as in other painting, but are compounded of the principal colours as we have intimated in our diſcourſe of colours for painting on enamel.

Another way to paint on GLASS.

Take very white *glaſs*, varniſh it very thin on one ſide with a white varniſh; then having made choice of ſome fine impreſs cut on paper juſt fit for the piece of glaſs you deſign to paint on, dip it in water, and letting it ſoak and dry a little, clap the picture ſide thereof to the varniſh ſide of the glaſs, as exactly plain and even as poſſible, and ſo let it dry thoroughly; afterwards moiſten the paper on the blank ſide, and with a blunt graver, draw off and trace the lines of the picture, which will afterwards remain perfectly and diſtinctly on the varniſh ſide of your glaſs quarre.

This draught is for the model; you muſt paint your filings in it, and obſerve that the tracings and ſtrokes of the picture are to ſerve you in ſhadowing, which cannot be repeated without diſadvantage to your piece.

The manner of painting on glaſs is quite contrary to that of limning or painting on cloth or wood; for in this, the paint being but on one ſide, is plainly viſible on the other. Here the ſettings off are firſt done; then the compound colours juſt run over, and ſo continuing until perfected: whereas on linen, &c. the ſetting off or heightenings are the laſt ſtrokes, and their ground colour or firſt is that which we end withal, and make our laſt lay in all pieces done on glaſs.

We do not ſhew the way to make up the colours, nor how to mix and finiſh the artificial ones, for that relates immediately to the art of painting, of which you will find in ſeveral other articles, and not to this art of glaſs-painting; and theſe noted herein are the ſame as in the other art of painting on cloth, and not very eaſily prepared.

You muſt alſo paint on glaſs juſt as in miniature with water colours, laying your picture underneath it as before; and this will ſhew finer than if done in oyl, beſides the colours dry in a moment.

Your pieces being thus done in oyl, or water colours, may receive a very additional and improving beauty by overlaying all the colours, except the ground, with *leaf ſilver*, which will appear very glorious and lively on ſuch as are tranſparent, to wit, *lakes*, *verditers*.

General remarks for all colours.

The firſt time a new pot is put into the furnace, it always leaves ſome fully or foulneſs on the glaſs, which ſpoils the colours; for this reaſon they always begin to melt white glaſs in it firſt, which afterwards they pour out again into another veſſel, to make common glaſs of it. This the workmen very well know; but the ſecond time, there will appear nothing of this foulneſs.

Particular care muſt be taken, that when you prepare materials for tinging glaſs, the moſt whereof are extracted from minerals, to do it in a ſeparate furnace, or not have any veſſels in it that you uſe for cryſtalline materials; for the ſmoke of metals and minerals, make cryſtal pale and uneven. The veſſels or pots which ſerve for one colour muſt not be made uſe of for another, and every colour ought to have its own pot.

Care muſt alſo be taken not to calcine materials more than is neceſſary, for then they burn and are good for nothing.

As a proportion ought to be kept and minded in every thing we do, ſo we will here lay down ſome which muſt not be exceeded whether for fruit or colours. Notwithſtanding when the workman makes any eſſay, if his colour be not deep enough in his mind, he may add as much as he ſhall think neceſſary, which ſometimes depends on the preparation of the metals more or leſs calcined, and often on the fancy of the workman.

It is neceſſary alſo to be obſerved, that all the doſe of the colouring ought not to be thrown on the melted glaſs at once, but at ſeveral times, and in proportion according to the quantity of it, ſtirring each time the materials, that they may both incorporate, and at the ſame prevent them from riſing and running over.

How to order the GLASS *in the furnace after it has been painted.*

After the glaſs has been completely painted, and the draughts perfectly finiſh'd, the difficulty remains in baking the pieces, ſo as to give it a conſiſtency with the glaſs, by penetration, which is to be done as follows:

You muſt work with the furnace here deſcrib'd, and its ſtove made of good crucible earth, to contain all the work, which muſt be ſtratified in the following manner.

Take good quick lime well digeſted, powdered, and finely ſearced, and for the better ſecurity, let it be digeſted three times in a potter's furnace, and then powder and ſearce it; then lay it very even about half an inch thick on the bottom of the ſtove, and upon that a layer of pieces of broken *Glaſs*, and upon that another layer of the powder, and ſo another of glaſs, then another of powder; the reaſon of making this ſtratification of powder and old glaſs is to prevent any injury from the violence of the fire, which will be very intenſe under the ſtove.

This done, upon the third bed or layer of powder, lay a layer of painted glaſs, and ſo continue to lay layer upon layer, each lay of powder and glaſs being evenly made until all the pieces of painted glaſs are put in or the ſtove full, and upon the laſt lay of glaſs, lay a layer of the powder ſomewhat thicker than the former.

Then cover the furnace with its ſhrowds of earth, joining and luting them well together all round with the beſt lute, ſo that it may admit of no reſpiration, but through the fire holes or the opening of the furnace; while you draw out the proofs or trials (by ſome call'd *watches*) which are bits of broken glaſs painted with the colours, and put in purely for the purpoſe of taking out and examining how the work goes on.

Having thus ordered the furnace, and the lute being well dried, begin to heat it gently with ſome charcoal on the outſide of the furnace at the entrance, and ſo proceed by degrees, and very leiſurely heightening it, leſt it ſhould break the glaſs, or ſpoil the paint.

Continue this for two hours, then thruſt the fire in further, and let it remain there for an hour, putting it in by little and little under the ſtove, where let it ſtand two hours longer; then increaſe the fire by degrees for two hours, and ſo continue to apply fuel till the furnace be full of charcoal, and you perceive the flame to convey it ſelf through every hole of the cover; keep it thus violent for three or four hours, ſhutting the door of the furnace.

You muſt be very cautious and careful during the whole work from the firſt two hours that the fire remains at the entrance.

From time to time you muſt draw out ſome of the pieces of glaſs that you put into the ſtove for trials or watches to ſee if the colours be melted and the yellow be qualified. You may perceive how the work goes on by the ſparkling of the iron bars under the ſtove.

As ſoon as you find the colours almoſt done, improve the fire with ſome very ſmall billets of dry wood; theſe muſt be very ſmall that they may be put in the more eaſily, ſmoke the leſs, and to make the flame inviron, reverberate over and round about the ſtove, which muſt be continued till the work is finiſhed, which will be in twelve or fourteen hours; then let the fire go out, and the work cool of it ſelf; then it will be finiſh'd, and take it out, or elſe it would ſoon burn the colours and break the glaſſes.

COLOURS *for* GLASS.

BLACK. Take ſcales of *iron* one ounce, ſcales of *copper* one ounce, *jet* half an ounce; reduce them to powder, and mix them.

BLUE. Take *powder blue* one pound, *ſal nitre* half a pound; mix them, and grind them well together.

CARNATION. Take *red chalk* eight ounces, *jet* four ounces, *iron* ſcales and litharge of *ſilver* of each two ounces, *gum arabick* half an ounce; diſſolve in water; grind all together for half an hour as ſtiff as you can; then put it in a glaſs and ſtir it well, and let it ſtand to ſettle fourteen days.

Another CARNATION *or* RED. Take *red-chalk* one pound, *jet* one pound and a half; *gum arabick* half a pound; let all be finely powdered; grind them well on a copper plate with rain water very thick, and let it ſtand three days to ſettle; then dry it on an earthen diſh, and grind it again on a copper plate.

GREEN. Take *red-lead* one pound, ſcales of *copper* one pound, and *flint* five pounds; divide them into three parts, and add to them as much *ſal nitre* as one of thoſe parts; put them into a crucible, and melt them with a ſtrong fire, and when it is cold, powder it, and grind it on a porphyry.

Another. Take *minium* four ounces, *ſand* one ounce, ſcales of *copper* calcin'd five ounces; mix them together.

GOLD COLOUR. Take *ſilver* an ounce, *antimony* half an ounce; melt them in a crucible; then pound the maſs to powder, and grind it on a copper plate; add to it *yellow oker* or *brick duſt* calcin'd again fifteen ounces, and grind them well together with water.

Another. Take prepared or *leaf ſilver*, lay each of them ſmooth and even on a plate of glaſs, and burn or anneal the ſame together, and the glaſs will be of a delicate golden or yellow colour.

Pointure *or* BLACK. Take ſcales of *iron* one part, and *jet* two parts; or ſcales of *iron* one part, of *jet* one part and a half; or ſcales of *iron* three parts, *jet* three parts, ſcales of *copper* two parts, and it will be a pleaſant colour.

Artificial jet for this purpoſe. Take *minium* or *red-lead* three parts, *flint* or *white pebbles* one part; mix, calcine, and grind them.

PURPLE. Take *minium* one pound, *brown ſtone* one pound, *white-flint* five pounds; divide them into three parts, and add to them as much *ſal nitre* as one of thoſe parts; calcine, melt, and grind it as you do the green.

RED. Take *jet* four ounces, litharge of *ſilver* two ounces, *red-chalk* one ounce; powder them fine and mix them.

A noble RED *or* GREEN *colour.* Take leaves of *gold* or calx of *gold* made by calcination, or *aqua regis*; put either of them on plates of glaſs, and heat them gradually red hot together; ſo will the glaſs be ting'd of a noble *red* colour, or elſe of a florid *green*, which colours reſult from the purity or impurity of the gold.

WHITE. Take *jet* two parts, *white flint* ground on a glaſs very fine one part; mix them. Or, *minium* or *red-lead* three pounds, *ſand* from the glaſs-houſe one pound; mix them.

YELLOW. Take *Spaniſh brown* ten parts, *leaf-ſilver* one part, *antimony* half a part; put all into a crucible, and calcine them well.

GLAUCUS. A ſea deity, repreſented as *Philoſtratus* ſays, with a long white beard and hair, ſoft and dropping about his ſhoulders; his eyes green and glittering; his brows full of wrinkles and green ſpots; his breaſt all over-grown with greeniſh ſea-weeds or moſs, his belly, and from thence downwards, fiſh-like, full of fins and ſcales.

To paint GLOBES, &c. *of various colours.*

Put warm *gum-water* into a glaſs *Globe*, and roll it about in it, ſo that it be wetted all over, then pour it out again; then your colours being all ready, with or through a hollow pipe, blow them into the *Globe*.

1. *Vermilion* to repreſent clouds or wavings.
2. Powder of *blue enamel.*
3. Powder of *copper ſcales.*
4. *Orpiment* in powder.
5. *Lake* in fine powder.
6. *Water gold* in powder.
7. *Leaf ſilver* in powder, or any other colours you like better. You may blow them to what parts of the *Globe* you pleaſe, by directing the pipe accordingly. Having done this, put a good quantity of plaſter in fine powder into the *Globe*, and ſhake it

it well all over, before and till the *gum-water* is dry, and ſo will it ſtick faſt round about; and what remains looſe ſhake it out, and ſo will the outſide of the *Globe* be finely marbled and colour'd.

To make the gum-water.

Put two ounces of *gum Arabick* or rather mouth *glue* in a quart of fair *water*, let it digeſt for two or three days in warm water; then boil it gently till all is melted, and ſtrain it through a flannel while it is hot, and keep it for uſe.

GLORY is repreſented in painting by a beautiful woman, the upper part of her body is almoſt naked, ſhe bears a ſphere, whereon are the twelve ſigns and a little image, holding a palm in one hand, and a garland in the other.

Her nakedneſs intimates, that ſhe needs no painting; her actions always being expos'd to view; the ſphere, that mundane conſiderations do not ſo oblige her to heroic actions as the celeſtial do. The tokens of victory ſhe holds, intimates, that theſe two are inſeparable, the one produces the other.

GLORY OF PRINCES is repreſented in painting, as a very beautiful lady with a golden circle about her forehead, interwoven with many precious jewels; her golden locks ſignify the magnanimous thoughts that poſſeſs the minds of Princes. She holds a pyramid ſignifying their glory in cauſing magnificent fabricks to be erected, ſignalizing them to poſterity.

GLUE a tenacious viſcid matter, which ſerves as a cement to bind or connect divers things together.

There are divers kinds of *Glues* made uſe of in divers arts, as the common *Glue*; glove *Glue*; parchment *Glue*; but the two laſt are more properly call'd *ſize*.

The *common* or *ſtrong Glue* is us'd by various kinds of artificers, joiners, cabinet-makers, *&c.*

The beſt is that made in *England* in ſquare pieces of a ruddy brown colour: *Flanders Glue* is accounted the next in goodneſs to the *Engliſh*.

Glue is made of the skins of all kinds of beaſts, as oxen, cows, calves, ſheep, *&c.* the older the beaſt is, the better is the *Glue* made of its hide.

Indeed whole skins are but very rarely us'd for this purpoſe, thoſe being capable of being apply'd to better purpoſe; but they make uſe of the ſhavings parings or ſcraps of it, ſometimes it is made of the feet, ſinews, nerves, *&c.* of beaſts. That made of whole skins is the beſt and that made of ſinews is the worſt, and hence ariſes the difference of *Glues*, for as our tanners generally make the *Glue* themſelves; they are not ſparing of the parings of the skins, which they never ſell; whereas in *France* the *Glue* makers being a peculiar kind of manufacturers, and having no parings, *&c.* but what they buy, they make uſe chiefly of ſinews, feet, *&c.*

The method of making GLUE.

In making *Glue* of parings they firſt ſteep them two or three days in water; then waſhing them well out, they boil them to the conſiſtence of a thick gelly.

Then they paſs this gelly while hot through ozier baskets, to ſeparate the impurities from it; and then let it ſtand ſome time to purify it further, when all the filth and ordures are ſettled to the bottom of the veſſel, they melt and boil it a ſecond time.

Then they pour it into flat frames or moulds; whence it is taken out pretty hard and ſolid, , and cut into ſquare pieces or cakes. They afterwards dry it in the wind in a ſort of coarſe net, at laſt ſtring it, to finiſh its drying.

The *Glue* made of ſinews, feet, *&c.* is manag'd after the ſame manner; only with this difference, that they bone and ſcour the feet, and don't lay them to ſteep.

The beſt *Glue* is that which is oldeſt.

The ſureſt way to try the goodneſs of *Glue* is to lay a piece to ſteep three or four days, and if it ſwell conſiderably without melting, and when taken out reſumes its former dryneſs, it is excellent.

Fiſh GLUE is a ſort of *glue* made of the nervous and mucilaginous parts of a large *fiſh*, found chiefly in the *Ruſſian* ſeas.

Theſe parts being boil'd, bear a near reſemblance to that viſcid matter found in the skins of cod-fiſh; when it is boil'd to the conſiſtence of a gelly, they ſpread it on a leaf of paper, and form it into cakes; in which ſtate it is ſent to us.

A GLUE *that will hold againſt fire or water.*

Mix a handful of *quick-lime* with four ounces of *linſeed-oil*; boil them to a good thickneſs, then ſpread it on tin plates in the ſhade, and it will become exceeding hard; but may be eaſily diſſolv'd over a fire, as *Glue*, and will effect the buſineſs to admiration.

GLUTTONY is repreſented in painting, by a woman in a ruſſet gown, with a long crane neck, and a pretty big belly, a hog lying by her.

Her belly denotes gormandizing, as making her belly her God. The ruſty or ruſſet gown ſhews that as ruſt eats iron, ſo does the glutton devour his ſubſtance, the hog denotes gluttony.

G. M. E, ſignifies *Giorgio* of *Mantua*, in other pieces of the abovementioned *Primaticcio.*

GOLD is a yellow metal, the heavieſt, pureſt, moſt ductile and ſhining, and on thoſe accounts, the moſt valuable of all metals.

The weight of *Gold* is to that of ſilver, as 19 to 10, a cubic nch of pure *Gold* weighs twelve ounces two drams and fifty two grains; and the cubic inch of ſilver ſix ounces five drams and wenty eight grains.

The pound weight or twelve ounces *Troy* of *Gold* is divided nto twenty four caracts.

The value of *Gold* is to that of ſilver, as 14 to 1, *ſtandard Gold* is worth 44 *l.* 10 *s.* *ſterling* the pound weight; *ſtandard ſilver* is worth 3 *l.* the pound, or 5 *s.* the ounce.

1. The firſt characteriſtick or property of *Gold*, is that it is the heavieſt of all bodies.

In every maſs of matter, heavier than *Mercury*, there muſt of neceſſity be ſome ſhare of *Gold* more or leſs; there not being in nature any body of intermediate gravity, *i, e.* no body whoſe gravity is to that of *Gold* more than as 14 to 19.

2. Its *ſecond* character is that of all known bodies, it is the moſt ductile and malleable; and of all bodies, its parts have the greateſt degree of attraction, *i. e.* cohere with the greateſt force.

Of this *Gold* beaters and wire drawers ſupply us with ſufficient proofs.

3. The *third* character of *Gold* is its fixedneſs in the fire, in which it exceeds all other bodies.

4. The *fourth* character is that it is not diſſoluble by any menſtruum in nature, except *aqua regia* and *Mercury.*

5. The *fifth* character is that it readily and ſpontaneouſly, as by ſome magnetic virtue attracts and abſorbs *Mercury.*

The *ſixth* character is that it withſtands the violence both of lead and antimony, *i. e.* being fus'd in the coppel along with either of thoſe matters, it does not diſſipate and fly off with them in fume; but remains fix'd and unchang'd.

All other metals except *Gold* and ſilver melted with lead, periſh with it, and evaporate by fire; and in all other metals except *Gold*, and even ſilver itſelf undergo the ſame fate.

All the known parts of the earth afford this precious metal, though with a deal of difference in point of purity and abundance.

America furniſhes the moſt; and particularly the mines of *Peru* and *Chili*, that of *Aſia* is eſteem'd the fineſt, particularly that of *Menaricabo* in the *Eaſt-Indies.*

The *Spaniards* ſay, that they ſometimes get *Gold* out of their *Peruvian* mines, twenty three carats fine, before it be purified.

And the *Gold* of *Axima* on the coaſt of *Africa*, is found from twenty two to twenty three carats.

Glauber is of opinion, that there is not any *ſand* or *ſtone*, but *Gold* may be procured from it; *limeſtone* excepted, but that indeed the expence of ſeparating exceeds the profits.

Gold is chiefly found in mines; though there is ſome alſo found in the *ſand* and *mud* of the rivers and torrents particularly in *Guinea.*

There is a third ſort of *Gold* found in the drains of the mountains of *Chili*; which they ſeparate from the earth by waſhing, whence the places where it is found or ſeparated are call'd *Lavaderoes.*

The earth in theſe places is uſually reddiſh, and very fine; at about ſix foot deep it is mixt with grains of large duſt; and from hence commences the *ſtratum* or bed of *Gold.*

Between are banks of ſoft, bluiſh-ſtone, mixt with yellow threads, which yet are not *Gold*, but only pyrites or marcaſites of *Gold.*

When they have diſcovered any of this earth, they endeavour to bring rivulets to it (which in thoſe mountains are very frequent) in order by their force to waſh and wear off the upper earth, and lay the golden *ſtratum* bare.

This they forward by digging with ſpades, *&c.* as ſoon as the golden earth is uncovered, they turn off the water, and dig up the ſoil by force of arm; and loading it on mules, carry it to the *Lavaderoes*, i. e. certain baſons of water where the earth paſſing under ſeveral repeated lotions, in different waters, the earthy and impure part is all ſeparated and carried off by the ſtream and the *Gold*, left at the bottom.

This method of getting *Gold* is very gainful; the expences being but very ſmall compar'd to thoſe in the common way by machines, fire and quickſilver.

The richeſt of theſe *Lavaderoes* is that *de l'eſtancia del rey*, twelve leagues from the *Conception*, a port of the *South-Sea.*

Thuringia and ſome other places along the *Rhine*, are the only places in *Europe*, where the *Gold* is got in this manner.

The *Gold* of mines is of two kinds, the one in ſmall pieces or grains of various forms and weight.

Of this ſort among the ſpecimens ſent by *Columbus* into *Spain*, to let them ſee the richneſs of his diſcovery, there were ſome of eighteen ounces weight, and the relations of thoſe times aſſert, that in the year 1502, there were others found of thirty two pound weight.

The other kind of *Gold* is dug up in ſtony glebes, which is what is call'd the mineral or ore of *Gold.*

Theſe glebes are of various colours, and uſually a hundred and fifty, or a hundred and ſixty fathom deep.

Theſe glebes uſually contain ſome other mineral matter along with the *Gold*, as *antimony*, *vitriol*, *ſulphur*, *copper* or *ſilver*; eſpecially the laſt, without ſome ſhare of which it is ſcarce ever found.

The

The manner of ſeparating Gold.

The metalline ſtone is firſt broken pretty ſmall with an iron mallet; then it is carried to the mills, where it is ground to a very fine powder, and laſtly is paſs'd through ſeveral braſs ſieves, the laſt of which is as fine as any of our ſilk ſieves.

The powder being thus prepar'd, is laid on wooden troughs, with a proper quantity of *Mercury* and water; and is there left to knead and ſaturate in the ſun and air for forty eight hours.

After this, the water with the recrementitious earth is drove out of the tubs, by means of other hot waters poured thereon.

When this is done, there remains nothing but a maſs of *Mercury*, with all the *Gold* that was in the ore.

The *Mercury* is ſeparated from it by diſtillation in large alembicks.

The *Gold* in this eſtate is call'd *virgin Gold*, as well as that found in the ſand of rivers, or that in grains in the mines, in that none of them have paſs'd the fire.

After this, it is uſually fus'd in crucibles, and caſt into plates or ingots.

Virgin Gold is *Gold* juſt as it is taken out of the mines, before it has undergone any action or preparation by fire.

Virgin Gold is ſaid to be very pale, and ſo ſoft, that it may be moulded into any figure with the hand; it will even take an impreſſion from a ſeal like the ſofteſt wax. To harden it, as alſo to heighten its colour, they mix emery with it.

Fine or *pure Gold*, is that purg'd by fire of all its impurities and all alloy.

The moderns frequently call it *Gold* of twenty four carats; but there is not in reality any ſuch thing as *Gold* ſo very pure; and there is always wanting at leaſt a quarter of a carat. *Gold* of twenty two carats, has one part of *ſilver* and another of *copper*; that of twenty three carats has half a part, *i. e.* half a twenty fourth of each.

In *England* at this time the ſtandard crown of *Gold*, is twenty two carats fine.

To make Gold *ſofter.*

Take *Mercury ſublimate*, *ſal armoniack*, of each a like quantity, powder them, melt *Gold*, and put to it a little of this powder, and it will be ſofter.

Another way to do the ſame.

Take *vitriol*, *verdet*, *ſal armoniack*, *burnt braſs*, of each one ounce, mix them with *aqua fortis*, let it ſtand in the heat for two days; and then let it harden, do this three times with *aqua fortis*, and let it dry, then reduce it to a powder, and to one dram put an ounce of *Gold*, three times, and it will be ſofter.

Or thus; quench *Gold* in water of *ſal armoniack*, and it will be ſofter.

Or thus; take *honey* and *oil* of each a like quantity, quench *Gold* in it three or four times, and it will be ſofter.

To colour and ſoften GOLD.

Diſſolve *verdegreaſe* in *vinegar*, and ſtrain it through a felt, then congeal it, and when it begins to grow thick, put ſome *ſal armoniack* to it, and let it harden a good while; then melt the gold with it, and it will heighten the colour, and make it ſoft.

To make GOLD *and ſilver ſofter.*

Take *Mercury ſublimate*, *ſal armoniack*, of each a like quantity, powder them, melt the *Gold*, and put to it a little of this powder, and it will be ſoft.

Another way to do the ſame.

Take *vitriol*, *verdet*, *ſal armoniack* and *burnt braſs*, of each an ounce, mix them with *aqua fortis*, and let it ſtand in the heat for two days; then let it harden; do thus three times with *aqua fortis*, let it dry, and reduce it to powder. To an ounce of *Gold*, put one dram of it three times, and it will be ſofter.

The way of CALCINING GOLD.

Diſſolve an ounce of *Gold* in three ounces of *aqua regalis*; then add to it four ounces of common *Mercury* purified, and paſs'd through waſh leather, which will precipitate the *Gold* to the bottom of the mattraſs, joining itſelf to it.

Then the *aqua regalis* will grow clear, which when it is, and ſeems to have no more *Gold* in it, decant it off, and then waſh your matter with warm water to dulcify it, and take away its ſaltneſs.

When the matter is dry'd, add to it its weight of flour of *brimſtone*; then pound the whole together, put them in a crucible, to which fit another at top, which muſt be bored at bottom, with a hole big enough to put a quill through, which lute well together and dry them.

Then put them in a round fire, which you muſt give them by degrees for four hours, the crucible being the laſt hour wholly covered over with coals, which let kindle and cool again.

Then open the crucible and you will find the *Gold* calcin'd, which *amalgamate* with four ounces of freſh *Mercury*; to which add five ounces more of flour of *brimſtome*, pounding them well together as before, then put the whole into crucibles, lute them and give them the ſame round fire as before; which reiterate a third time, as before, the better to calcine and open the *Gold*; then put it into a glaz'd earthen pan pretty deep, and pour on it good ſpirit of wine, that may ſwim two inches above, then put fire to it, and when it is burnt, you will have a very fine *Gold* in an impalpable calx, well opened, which edulcorate with warm water diſtill'd, and dry it gently.

LIQUID GOLD *and Silver.*

Take five or ſix leaves of *Gold* or *Silver*, and grind them with a ſtiff *gum lake water*, and a good quantity of *ſalt*, as ſmall as you can; then put it into a vial or glaz'd veſſel, add to it as much fair *water* as may diſſolve the ſtiff *gum-water*; then let it ſtand four hours that the *Gold* may ſettle, decant off this water, and put in more till the *Gold* is clean waſh'd; then put more fair water to the *Gold*, a little *ſal armoniack* and common *ſalt*, digeſting it cloſe for four days; then put all into a piece of thin glover's leather (whoſe grain is peel'd off) and hang it up, ſo will the *ſal armoniack* fret away, and the *Gold* remain behind, which keep.

Or thus; grind leaf *Gold* with ſtrong or thick *gum-water*, very fine, and while you are grinding it, add more thick *gum-water*, being very fine waſh it in a great ſhell, as you do *bice*, then temper it with a little *Mercury ſublimate*, and a little diſſolv'd *gum* to bind it to the ſhell; ſhake it, and ſpread the *Gold* about the ſides thereof, that it may be all of one colour and fineneſs, which uſe with fair water, as you do other colours.

To burniſh Gold.

Do the ſame as to liquid SILVER. Take *gum-lake* and diſſolve it into a ſtiff water, then grind a blade or two of *ſaffron* with it, and you will have a fair *Gold*; when you have laid it and it is thoroughly dry, burniſh it with a dog's tooth.

Or thus; Having written what you had a mind with your pen and pencil, cut the leaf *Gold* or *Silver* into pieces, according to the ſize, take it up with a feather, or cotton, *&c.* and lay it upon the writing or drawing, which preſs down with a piece of wool, and being dry burniſh it.

To make a very fine poliſh'd GOLD.

The woods you would gild muſt be very ſmooth; and to render them the ſmoother, it will be proper to paſs ſea dog's skin over them.

Then *ſize* it over with a ſtuff or *ſize* made of the cuttings of white leather gloves, (See SIZE) and when it is thoroughly dry, lay on nine or ten layers of *white.*

When this is perfectly dry uſe your ſhave graſs, that you may render it ſo much the kinder, and then having made ſome *ſize* and water warm, dip a linen rag into it, which wring out, and then rub the *white.*

Then lay on two or three layers of *Gold* colour, and more if it be not of a good body or deep enough; and when it is dry rub it well with a dry cloth, till it is bright again, then take of the ſtrongeſt brandy you can get, and with a pencil bruſh waſh the *Gold* colour with this brandy; and having leaf *Gold* ready cut, lying upon the cuſhion, clap it on the moment the pencil is gone over the part; and when it is dry poliſh it with a dog's tooth.

How to lay on GOLD *and* SILVER.

Set your piece ſlanting, and wet a part with a large pencil dipp'd in fair water, then having the *Gold* ready cut on the cuſhion, lay on the *Gold*, taking it up with a cotton.

When the whole is gilded, ſet it by to dry; but not either in the wind or ſun, and when it is dry enough, burniſh it with a dog's tooth.

To know when it is in a fit temper, paſs the dog's tooth over it in ſome little places; and if it does not rub kindly, but peels off, it is not dry enough.

But on the other hand take care not to let it be too dry; for it will require ſo much the more trouble in poliſhing, and after you have done all you can, it will not have the luſtre you deſire.

To lay Gold *on any thing.*

Temper *red-lead* ground fine with *linſeed-oil*, write with it, and lay leaf *Gold* upon it, let it dry and poliſh it.

To lay Gold *on glaſs.*

Grind together *chalk* and *red-lead* each a like quantity, and temper them with *linſeed-oil*; lay it on and when it is almoſt dry, lay leaf *Gold* on it, let it be thoroughly dry and then poliſh it.

To MATT GOLD.

Make a red with *red-lead*, a little *vermilion* and the white of an *egg*, well beaten up; grind the whole upon a marble, and clap it into the deep or hollow places with a pencil.

To make SHELL GOLD *and* SHELL SILVER.

Grind leaf *Gold* with honey juſt out of the hive, or very pure on a clean marble, till it is extremely ſoft under your hand; then put it into a glaſs of fair water, and ſtir it, changing the water till it is very clear and fine.

Then pour it into the quantity of a penny-worth of *aqua fortis*, and let it lie for two days, then take out the *Gold*, and the *aqua fortis* may ſerve another time, the ſame may be done with *Silver*.

When you would lay on either the one or the other, temper it with one or two drops of a very thin *gum water*, and to give it the ſmoother face, let your water be ſoap'd.

It will be alſo proper to have a waſh of *gall-ſtone* under the *Gold*, which ſets it much off.

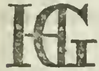
To dye SILK *a* GOLD *colour.*

This muſt be dyed after the ſame manner as the ſtraw colour is, only when it is become reaſonably deep, put it into the laſt ſuds of the orange-liquor and ſtir it therein ſo long, till you are ſure it is grown deep enough, then rinſe it out and dry it.

To dye ſtuff a GOLD *colour.*

Let the ſtuff be firſt dyed yellow, then ſet freſh water over the fire, and for every pound of ware, uſe an ounce of *fuſtel-wood*, call'd alſo *yellow ſhavings*, and a good quantity of coarſe *pot-aſhes*; let the dye boil for half an hour, and afterwards work the ſtuff in it.

For a GOLDEN figure in painting, lay on *ſhell Gold*, and ſhade with *Gall ſtone.*



HENRY GOLTZIUS, This celebrated *Dutch* engraver imitated the manner of ſeveral maſters, who liv'd before him. He engrav'd the paintings of *Raphael* and other maſters, he us'd this mark.

G. P. ſignifies *George Pens.*

GRACE OF GOD is repreſented in painting, by a pretty agreeable damſel all naked, with a very becoming head dreſs; her golden locks plaited, and ſurrounded with ſplendor; holding in both hands a *cornucopia*, ſhe pours from it many things uſeful, and a ſhining ray round even to the ground.

Her nakedneſs denotes her innocence, that needs no external ornaments, the benefits and good things ſhe diſperſes ſhew, that they all proceed from heaven.

GRACE and GREATNESS. There is ſome degree of merit in a picture where nature is exactly copied, though in a low ſubject; ſuch as drolls, country-wakes, flowers, landſcapes, &c. and more in proportion as the ſubject riſes, or the end of the picture is this exact repreſentation. Herein the *Dutch* and *Flemiſh* maſters have been equal to the *Italians*, if not ſuperior to them in general. What gives the *Italians* and their maſters the preference, is, that they have not ſervilely follow'd common nature, but rais'd and improv'd, or at leaſt have always made the beſt choice of it.

This gives a dignity to a low ſubject, and is the reaſon of the eſteem we have for the landſcapes of *Salvator Roſa*, *Filippo Laura*, *Claude Lorrain*, the *Pouſſins*; the fruit of the two *Michael Angelo's*, the *battaglia* and *compadoglio*; and this, when the ſubject itſelf is noble, is the perfection of painting: as in the beſt portraits of *Vandyck*, *Rubens*, *Titian*, *Rafaelle*, &c. and the hiſtories of the beſt *Italian* maſters; chiefly thoſe of *Rafaelle*; he is the great model of perfections! All the painters being rank'd in three ſeveral claſſes according to the degrees of their merit, he muſt be allow'd to poſſeſs the firſt alone.

Common nature is no more fit for a picture, than plain narration is for a poem: a painter muſt raiſe his ideas beyond what he ſees, and form a model of perfection in his own mind, which is not to be found in reality; but yet ſuch a one as is probable, and rational. Particularly with reſpect to mankind, he muſt as it were raiſe the whole ſpecies, and give them all imaginable beauty and grace, dignity and perfection; every ſeveral character, whether it be good, or bad, amiable, or deteſtable, muſt be ſtronger and more perfect.

At court, and elſewhere amongſt people of faſhion, one ſees another ſort of beings than in the country, or the remote and inferior parts of the town; and amongſt theſe there are ſome few that plainly diſtinguiſh themſelves by their noble and graceful airs, and manner of acting. There is an eaſy gradation in all nature; the moſt ſtupid of animals are little more than vegetables, the moſt ſagacious and cunning are hardly inferior to the loweſt order of men, as the wiſeſt and moſt virtuous of theſe are little below the angels. One may conceive an order ſuperior to what can any where be found on our globe; a kind of new world may be form'd in the imagination, conſiſting, as this, of people of all degrees and characters; only heightned, and improv'd; a beautiful gentlewoman muſt have her defects overlook'd, and what is wanting to complete her character ſupply'd: a brave man, and one honeſtly and wiſely purſuing his own intereſt, in conjunction with that of his country, muſt be imagin'd more brave, more wiſe, more exactly and inflexibly honeſt than any we know, or can hope to ſee; a villain muſt be conceiv'd to have ſomething more diabolical than is to be found even amongſt us; a gentleman muſt be more ſo, and a peaſant have more of the gentleman, and ſo of the reſt. With ſuch as theſe an artiſt muſt people his pictures.

Thus the ancients have done, notwithſtanding the great and exalted ideas we may have of the people of thoſe times, from their hiſtories, (which probably are improv'd by the hiſtorians uſing the ſame management in their writings as I have recommended to the painters; it was the poet's proper buſineſs ſo to do) one can hardly believe them to be altogether ſuch as we ſee in the antique ſtatues, bas-reliefs, medals, and intaglia's. And thus the beſt modern painters and ſculptors have done. *Michael Angelo* no where ſaw ſuch living figures as he cut in ſtone.

When a man enters into that awful gallery at *Hampton-Court*, he finds himſelf amongſt a ſort of people ſuperior to what he has ever ſeen, and very probably to what thoſe really were. Indeed this is the principal excellence of thoſe wonderful pictures, as it muſt be allow'd to be that part of painting which is preferable to all others.

What a grace and majeſty is ſeen in the great Apoſtle of the *Gentiles*, in all his actions, preaching, rending his garments, denouncing vengeance upon the ſorcerer! What a dignity is in the other Apoſtles wherever they appear, particularly the Prince of them in the cartoon of the death of *Ananias!* How infinitely and divinely great and gentle is the Chriſt in the boat!

But theſe are exalted characters which have a delicacy in them as much beyond what any of the gods, demi-gods, or hero's of the ancient Heathens can admit of, as the Chriſtian Religion excels the ancient ſuperſtition. The proconſul *Sergius Paulus* has a greatneſs and grace ſuperior to his character, and equal to what one can ſuppoſe *Cæſar*, *Auguſtus*, *Trajan*, or the greateſt amongſt the *Romans* to have had. The common people are like gentlemen; even the fiſhermen, the beggars, have ſomething in them much above what we ſee in thoſe orders of men.

And the ſcenes are anſwerable to the actors; not even the beautiful gate of the temple, nor any part of the firſt temple, nor probably any building in the world had that beauty and magnificence as appears in what we ſee in the cartoon of healing the cripple. *Athens* and *Lyſtra* appear in theſe cartoons to be beyond what we can ſuppoſe they were, when *Greece* was in its utmoſt glory; even the place where the Apoſtles were aſſembled (in the cartoon of *Ananias)* is no common room; and tho' the ſteps and rails which were made on purpoſe for them for the exerciſe of their new function, have ſomething expreſſive of the poverty and ſimplicity of the infant church, the curtain behind, which alſo is part of the Apoſtolical equipage, gives a dignity even to that.

'Tis true, there are ſome characters which are not to be improv'd, as there are others impoſſible to be perfectly conceiv'd, much leſs expreſs'd. The idea of God no created being can comprehend, the divine mind only can, and 'tis the brighteſt there; and infinitely bright! And would be judg'd to be ſo even by us, tho' the difficulties ariſing from the conſideration of the moral and natural evil, which is in the world, were not to be ſolv'd by the common expedients. I will only venture to ſay with reſpect to the latter, that this is ſo far from being an objection to the infinite goodneſs of God, that God could not have been infinitely good, if he had not produc'd an order of beings, in which there was ſuch a mixture of natural evils as to be juſt preponderated by the enjoyments, ſo as upon the foot of account to render being eligible; for without this, one inſtance of goodneſs had been omitted.

No ſtatue, or picture, no words can reach this character; the *Coloſſean* ſtatue of *Phidias*, the pictures of *Rafaelle*, are but faint ſhadows of this infinite and incomprehenſible Being. THE THUNDERER, the BEST, AND GREATEST: The FATHER OF GODS AND MEN, of *Homer*; the ELOHIM, the JEHOVAH, the I AM THAT I AM, of *Moſes*; the LORD of HOSTS, of the prophets: Nay the GOD AND FATHER OF OUR LORD JESUS CHRIST, the ALPHA and OMEGA, the ALL IN ALL of the New Teſtament: Theſe give us not an adequate idea of him, though that comes neareſt where not terror, and fury, but majeſty, power, wiſdom, and goodneſs, is beſt expreſs'd. A God incarnate, and Saviour of mankind by obedience and ſuffering; a crucified God riſen from the dead: theſe are characters that have ſomething ſo ſublime in them, that we muſt be contented to own our beloved *Rafaelle* has fail'd here, more eſpecially in ſome inſtances; I don't mean that in the cartoon of giving the keys, for that I verily believe has receiv'd ſome injury, and is not now like what *Rafaelle* made it. That incomparable hand that painted the hiſtory of *Cupid* and *Pſyche*, in the palace of *Chigi* at *Rome*, has carried the fictitious deities of the Heathens as high as poſſible, but not beyond what ſhould be conceiv'd of them; as *Michael Angelo Buonaroti* (particularly in two or three drawings) has made Devils not ſuch as low genius's repreſent them, but like thoſe of *Milton*; but the proper idea of a Devil has ſuch an exceſs of evil in it as cannot be exaggerated; in all ſuch caſes 'tis ſufficient if all be done that can be done; the painter muſt ſhew what he aims at, he muſt give him that ſees the picture all the aſſiſtance he can, and then leave him to ſupply the reſt in his own imagination.

There are other characters, which tho' inferior to theſe, are ſo noble, that he muſt be a happy man who can conceive them juſtly, but more ſo if he can expreſs them: Such are thoſe of *Moſes*, *Homer*, *Zenophon*, *Alcibiades*, *Scipio*, *Cicero*, *Rafaelle*, &c. If we ſee theſe pretended to be given in picture, we expect in them all that greatneſs and grace I have been recommending; all is neceſſary here in order to ſatisfy us that the hiſtory is truly related; as the pleaſure we take in having our minds fill'd with fine and extraordinary ideas is a ſufficient reaſon for raiſing all the more inferior characters. Life would be an inſipid thing indeed if we never ſaw, or had ideas of any thing but what we commonly ſee; a company of aukward ſilly-looking people, doing what is of no conſequence but to themſelves in their affairs; and to ſee ſuch in picture can give no great pleaſure to any that have a true and refin'd taſte.

A hiſtory painter muſt deſcribe all the various characters, real or imaginary; and that in all their ſituations, pleas'd, griev'd, angry, hoping, fearing, *&c.* a face painter has to do with all the real characters, except only ſome few of the meaneſt, and the moſt ſublime, but not with that variety of ſentiments as the other. The whole buſineſs of his life is to deſcribe the *golden age*, when every one of his people muſt therefore appear pleas'd, and in good humour, but varied ſuitably to the rais'd character of the perſon drawn; whether this tranquillity and delight be ſuppos'd to ariſe from the ſight of a friend, a reflection upon a ſcheme well laid, a battle gain'd, ſucceſſes in love, a conſciouſneſs of ones own worth, beauty, wit, agreeable news, truth diſcover'd, or from whatever other cauſe. If a Devil were to have his portrait made, he muſt be drawn as *abſtracted from his own evil, and ſtupidly good*, (to uſe *Milton*'s words).

If ſome grave characters require an air of thoughtfulneſs, as if engag'd in a diligent ſearch after truth, or in ſome important project, they muſt however not appear diſpleas'd, unleſs in ſome rare inſtances, as *Van-Dyck* has put ſomething of ſorrow in one picture of his unfortunate patron King *Charles* I. (I mean that at *Hampton-Court)* which I believe was done when he was entring into his troubles, and which is therefore in that reſpect hiſtorical. In general; the painting room muſt be like *Eden* before the fall, like *Arcadia*, the joyleſs, turbulent paſſions muſt not enter there.

Thus to raiſe the character, to diveſt an unbred perſon of his ruſticity, and give him ſomething at leaſt of a gentleman; to make one of a moderate ſhare of good ſenſe appear to have a competency, a wiſe man to be more wiſe, and a brave man to be more ſo, a modeſt, diſcreet woman to have an air ſomething angelical, and ſo of the reſt; and then to add that joy, or peace of mind at leaſt, and in ſuch a manner as is ſuitable to the ſeveral characters, is abſolutely neceſſary to a good face painter: but 'tis the moſt difficult part of his art, and the laſt attain'd; perhaps 'tis never ſo much as thought of by ſome, all that they aim at is to make ſuch a likeneſs of the face as ſhall be known immediately; and that it be young, fair, and handſome; and frequently thoſe for whom the pictures are made expect no more; whether the characters of wiſdom or folly be impreſs'd upon them it matters not. Accordingly, we ſee portraits which are perfect burleſques upon the minds of the perſons drawn; a wiſe man ſhall appear with the air of a fop; a man of ſpirit and wit, like a ſmart, or a pretty fellow; a modeſt ingenious man like a beau, a virtuous lady as a meer coquet.

The late Duke of *Buckingham (Villers)* when he heard a lady commended for her goodneſs, ſwore ſhe was ugly; becauſe beauty being a woman's top-character, he concluded that would have been inſiſted on if there was any ground for it. A painter ſhould obſerve, and pronounce ſtrongly the brighteſt part of the character of him he draws. To give an air of youth, and gaiety to the portrait of one who is entitled to nothing higher, is well enough; but to overlook a noble and ſublime character, and ſubſtitute this in the place of it, is deteſtable. The only ſuppoſing a man capable of being pleas'd with ſuch a piece of falſe flattery, is a lampoon upon his underſtanding.

Nor is the beauty of the face and perſon, whether as to the age, features, ſhape, or colour to be unregarded, or (where it can be done) unimprov'd; indeed ſomething of this will naturally fall in when the mind is expreſs'd, which cannot be done to advantage without giving ſome to the body.

But the face painter is under a greater conſtraint in both reſpects than he that paints hiſtory; the additional grace and greatneſs he is to give, above what is to be found in the life, muſt not be thrown in too profuſely, the reſemblance muſt be preſerv'd, and appear with vigour; the picture muſt have both. Then it may be ſaid, that the gentleman, or lady, makes a fine picture: but the likeneſs not being regarded, 'tis not they, but the painter that makes it; nor is there any great difficulty in making ſuch fine pictures.

I was lately obſerving with a great deal of pleaſure how the ancients had ſucceeded in the three ſeveral ways of managing portraits: I happen'd to have them before me (amongſt others) ſeveral medals of the Emperor *Maximinus*, who was particularly remarkable for a long chin; one medal of him had that, but that the artiſt might be ſure of a likeneſs he had exaggerated it; another had a mind to flatter, and he had par'd off about half of it; but theſe as they wanted the juſt reſemblance, ſo there was a poverty in them, they were deſtitute of that life and ſpirit which the other had, where nature ſeems to have been more cloſely follow'd. In making of portraits we muſt keep nature in view, if we launch out into the deep we are loſt.

What it is that gives the grace and greatneſs I am treating of, whether in hiſtory or portraits, is hard to ſay. The following rules may however be of ſome uſe on this occaſion.

The airs of the heads muſt eſpecially be regarded. This is commonly the firſt thing taken notice of when one comes into company, or into any publick aſſembly, or at the firſt ſight of any particular perſon; and this firſt ſtrikes the eye, and affects the mind when we ſee a picture, a drawing, *&c.*

The ſame regard muſt be had to every action, and motion. The figures muſt not only do what is proper, and in the moſt commodious manner, but as people of the beſt ſenſe and breeding, (their character being conſider'd) would, or ſhould perform ſuch actions. The painter's people muſt be good actors; they muſt have learn'd to uſe a human body well; they muſt ſit, walk, lie, ſalute, do every thing with a grace. There muſt be no aukward, ſheepiſh, or affected behaviour, no ſtrutting, or ſilly pretence to greatneſs; no bombaſt in action; nor muſt there be any ridiculous contorſion of the body, nor even ſuch appearances, or fore-ſhortnings as are diſpleaſing to the eye, though the ſame attitude in another view might be perfectly good.

Not that 'tis poſſible that every part of a picture, or even of a ſingle figure can be equally well diſpos'd, ſomething may not be as one would wiſh it; yet in the main it may be better than if it were otherwiſe. More may be loſt than gain'd by the alteration; 'tis here as 'tis in life, we are frequently uneaſy under certain circumſtances, but thoſe being remov'd, we wiſh ourſelves as we were before; the preſent grievance ſtrikes ſtrongly on our minds, we either don't ſee, or are not ſo livelily affected with the conſequences of a change.

The contours muſt be large, ſquare, and boldly pronounc'd to produce greatneſs, and delicate and finely wav'd and contraſted to be gracious. There is a beauty in a line, in the ſhape of a finger, or toe, even in that of a reed, or leaf, or the moſt inconſiderable things in nature. Some of the drawings of *Giulio Romano* are inſtances of this kind; his inſects and vegetables are natural, but as much above thoſe of other painters as his men are: there is that in theſe things which common eyes ſee not, but which the great maſters know how to give, and they only.

But this is not all; nature with all its beauties has its poverties, ſuperfluities and defects, which are to be avoided and ſupply'd, but with great care and judgment; that inſtead of exceeding nature, it be not injur'd. There is (for example) great beauty in a certain ſquareneſs in pronouncing a feature, or any part of a figure, this ſome have carried to an exceſs, and have thereby diſcover'd they knew ſomething, but not enough; which is the caſe in many other inſtances. What is here ſaid of drawing, is alſo applicable to colouring.

The draperies muſt have broad maſſes of light and ſhadow, and noble large folds to give a greatneſs; and theſe artfully ſubdivided, add grace. As in that admirable figure of St. *Paul* preaching, which has been already ſpoken of, the drapery would have had a greatneſs if that whole broad light had been kept, and that part which is flung over his ſhoulder, and hangs down his back, had been omitted; but that adds alſo a grace. Not only the large folds and maſſes muſt be obſerv'd, but the ſhapes of them, or they may be great, but not beautiful.

The linen muſt be clean and fine; the ſilks and ſtuffs new, and the beſt of the kind.

Lace, embroidery, gold and jewels muſt de ſparingly employ'd. Nor are flower'd ſilks ſo much us'd by the beſt maſters as plain, nor theſe ſo much as ſtuffs or fine cloth; and that not to ſave themſelves trouble, of which at the ſame time they have been profuſe enough. In the cartoons, *Rafaelle* has ſometimes made ſilks, and ſome of his draperies are ſcollop'd, ſome a little ſtrip'd, ſome edg'd with a kind of gold lace, but generally they are plain. Tho' he ſeems to have taken more pains than he needed in the landſcapes, as he has alſo thoſe badges of ſpiritual dignity on the heads of Chriſt and the Apoſtles. But theſe, as all other enſigns of grandeur and diſtinction, as they have been wiſely invented to procure reſpect, awe and veneration, give a greatneſs as well as beauty to a picture.

'Tis of importance to a painter to conſider well the manner of clothing his people. Mankind have ſhewn an infinite variety of fancy in this, and for the moſt part have diſguis'd rather than adorn'd human bodies. But the trueſt taſte in this matter the antient *Greeks* and *Romans* ſeem to have had; at leaſt the great idea we have of thoſe brave people, prejudices us in favour of whatever is theirs, ſo that it ſhall appear to us to be graceful and noble. Upon either of which accounts, whether of a real or imagin'd excellence, that *manner* of cloathing is to be choſen by a painter when the nature of his ſubject will admit of it. Poſſibly improvements may be made, and ſhould be endeavour'd, provided one keeps his antique taſte in view, ſo as to preſerve the benefit of prejudice juſt now ſpoken of. And this very thing *Rafaelle* has done with great ſucceſs, particularly in the cartoons. Thoſe that, in repreſenting antient ſtories, have follow'd the habits of their own times, or gone off from the antique, have ſuffer'd by it; as *Andrea del Sarto* (who firſt led the way) and moſt of thoſe of the *Venetian* ſchool have done.

But howſoever a figure is clad, this general rule is to be obſerved, *That neither the naked muſt be loſt in the drapery, nor too conſpicuous*, as in many of the ſtatues and *bas reliefs* of the antients; and which (by the way) they were forc'd to, becauſe to have done otherwiſe, would not have had a good effect in ſtone.

The naked, in a cloathed figure, is as the anatomy in a naked figure; it ſhould be ſhewn, but not with affectation.

Portrait painters ſeeing the diſadvantage they were under in following the dreſs commonly worn, have invented one peculiar to pictures in their own way, which is a compoſition partly that, and partly ſomething purely arbitrary.

Such is the ordinary habit of the ladies, that how becoming ſoever they may be fancied to be, as being worn by them, or what we are accuſtom'd to, or upon whatever other account, 'tis agreed on all hands, that in a picture they have but an ill air; and accordingly are rejected for what the painters have introduc'd in lieu of it, which is indeed handſome, and perhaps may be improv'd.

In the gentlemens pictures the caſe is very different; 'tis not ſo eaſy to determine as to their drapery.

What is to be ſaid for the common dreſs is, That

It gives a greater reſemblance; and

Is hiſtorical as to that article.

The arguments for the other are, That

They ſuit better with the ladies pictures, which (as has been obſerv'd) are univerſally thus dreſs'd:

They are not ſo affected with the change of the faſhion as the common dreſs; and

Are handſomer, that is, have more grace and greatneſs.

Let us ſee how the caſe will ſtand, this latter conſideration of handſomeneſs being for the preſent ſet aſide.

The firſt argument in favour of the arbitrary looſe dreſs ſeems to have no great weight; nor is there ſo much as is commonly thought in the ſecond; becauſe in thoſe pictures which have that kind of drapery, ſo much the dreſs of the time, is always, and muſt be retain'd, and that in the moſt obvious and material parts, that they are influenced by the change of faſhion in a manner as much as thoſe in the habits commonly worn. For proof of this, I refer you to what was done when the great wiggs and ſpreading huge neck-cloths were in faſhion. So that here does not ſeem to be weight enough to balance againſt what is on the other ſide, even when the greateſt improvement as to the colour, or materials of the common dreſs is made, for ſtill there will be a ſufficient advantage upon account of reſemblance and hiſtory to keep down the ſcale.

Let us now take in the argument of grace and greatneſs, and ſee what effect that will have.

The way to determine now is to fix upon the manner of following the common dreſs, whether it ſhall be with or without improvement, and in what proportion: This being done, let that you have fix'd on be compar'd with the arbitrary, looſe dreſs in competition with it, and ſee if the latter has ſo much the advantage in grace and greatneſs, as to over-ballance what the other had when theſe were not taken in: If it has, this is to be choſen; if not, the common dreſs.

Thus I have put the matter into the beſt method I was able in order to aſſiſt theſe concern'd to determine for themſelves, which they can beſt do, fancy having ſo great a part in the affair. And ſo much for this controverſy.

There is an artificial grace and greatneſs ariſing from the oppoſition of their contraries. As in the tent of *Darius* by *le Brun*, the wife and the daughters of that prince owe ſomething of their beauty and majeſty to the hideous figures that are about them. But a greater man than *le Brun* ſeems to have condeſcended to be beholden to this artifice in the banquet of the Gods at the marriage of *Cupid* and *Pſyche*; for *Venus*, who comes in dancing, is ſurrounded with foils, as the *Hercules*, the face of his lion's skin, *Vulcan*, *Pan*, and the mask in the hand of the muſe next to her. Some ſubjects carry this advantage along with them, as the ſtory of *Andromeda* and the monſter; *Galatea* with the *Tritons*; and in all ſuch where the two contraries, the maſculine and feminine beauties are oppos'd (as the figures of *Hercules* and *Dejanira* for inſtance.) Theſe mutually raiſe and ſtrengthen each other's characters. The Holy Family is alſo a very advantageous ſubject for the ſame reaſon. I need not enlarge here; the artifice is well known, and of great extent; 'tis practis'd by poets, hiſtorians, divines, *&c.* as well as painters.

What I have hitherto ſaid will be of little uſe to him who does not fill and ſupply his mind with noble images. A painter ſhould therefore read the beſt books, ſuch as *Homer*, *Milton*, *Virgil*, *Spencer*, *Thucydides*, *Livy*, *Plutarch*, &c. but chiefly the Holy Scripture, where is to be found an inexhauſtible ſpring, and the greateſt variety of the moſt ſublime thoughts, expreſs'd in the nobleſt manner in the world. He ſhould alſo frequent the brighteſt company, and avoid the reſt. *Rafaelle* was perpetually converſant with the fineſt genius's, and the greateſt men at *Rome*; and ſuch as theſe were his intimate friends. *Giulio Romano*, *Titian*, *Rubens*, *Van Dyck*, &c. to name no more, knew well how to ſet a value upon themſelves in this particular. But the works of the beſt maſter in painting and ſculpture ſhould be as a painter's daily bread, and will afford him delicious nouriſhment.

If I had been ſhewn a picture of *Rafaelle*'s (ſaid *Carlo Maratti* to his friend) and not having ever heard of him, had been told 'twas the work of an angel, I ſhould have believed it. The ſame friend of *Carlo Maratti* ſaid he had ſeen an entire book conſiſting of about two or three hundred drawings of heads which the ſame *Carlo* had made after that of the *Antinoüs*, and which he ſaid he had ſelected out of about ten times the number he had drawn after that one head; but confeſs'd he had never been able to reach what he ſaw in his model. Such was the excellency of the ſculptor! and ſuch the diligence, perſeverance and modeſty of *Carlo!*

The antients poſſeſs'd both the excellent qualities I have been treating of, among whom *Apelles* is diſtinguiſh'd for grace. *Rafaelle* was the modern *Apelles*, however not without a prodigious degree of greatneſs: His ſtyle is not perfectly antique, but ſeems to be the effect of a fine genius, accompliſh'd by ſtudy in that excellent ſchool: 'Tis not antique, but (may I dare to ſay it?) 'tis better, and that by choice and judgment. *Giulio Romano* had grace and greatneſs, more upon the antique taſte, but not without a great mixture of what is peculiarly his own, and admirably good, but never to be imitated. *Polydore* in his beſt things was altogether antique. The old *Florentine* ſchool had a kind of greatneſs that like *Hercules* in his cradle promis'd wonders to come, and which was accompliſhed in a great meaſure by *Leonardo da Vinci* (who alſo had grace) but more fully and perfectly by *Michael Angelo Buonarota:* His ſtyle is his own, not antique, but he had a ſort of greatneſs in the utmoſt degree, which ſometimes ran into the extreme of terrible, though in many inſtances he has a fine ſeaſoning of grace. When *Parmeggiano* copy'd him, and flung in his own ſweetneſs, they together make a fine compoſition: I don't ſay however that they are preferable to what is entirely of *Michael Angelo*, or even to what is entirely of *Parmeggiano*, eſpecially his beſt; but they are as if they were of another hand, of a character between both: For *Parmeggiano* was infinitely ſweet! Grace ſhines in all he touch'd, and a greatneſs ſupports it, ſo as one would not wiſh him other than he is; his ſtyle is entirely his own, not in the leaſt modern, nor very much upon the antique: what he did ſeems to flow from nature, and are the ideas of one in the golden age, or ſtate of innocence. *Baccio Bandinelli* had a great ſtyle, and ſometimes not without grace. *Correggio* had grace not inferior to *Parmeggiano*, and rather more greatneſs; but different in both from him, and from the antique: What he had was alſo his own, and was chiefly employ'd on religious ſubjects, or what had nothing terrible in them. *Titian*, *Tintoret*, *Paolo Veroneſe*, and others of the *Venetian* ſchool have greatneſs and grace, but 'tis not antique, however 'tis *Italian*. *Annibale Carracci* was rather great than gentile, tho' he was that too; and *Guido*'s character is grace. *Rubens* was great, but rais'd upon a *Flemiſh* idea. *Nicholas Pouſſin* was truly great and graceful, and juſtly ſtiled the *French Rafaelle*. *Salvator Roſa*'s landſcapes are great, as thoſe of *Claude Lorrain* are delicate: Such is the ſtyle of *Filippo Laura*; that of the *Borgognone* is great. To conclude, *Van Dyck* had ſomething of both theſe good qualities, but not much, nor always; he generally kept to nature, choſen in its beſt moments, and ſomething rais'd and improv'd; for which reaſon he is in that particular, and when he fell not lower, the beſt model for portrait-painting, unleſs we prefer a *chimera* of the painter, to a true, or at moſt a civil repreſentation of our ſelves or friends; and would have a cheat put upon poſterity, and our own or friends reſemblance loſt and forgotten for the ſake of it.

The notions of mankind vary in relation to beauty, and in ſome particulars with reſpect to magnanimity: It may be worth a painter's while to obſerve what were thoſe the antients had in theſe matters, and then to conſider whether they agree with the preſent taſte; and if they do not, whether they or we are in the right, if it can be determined by reaſon. If it depends upon fancy only, then let him conſider whether the prejudices we are apt to have for the antients, will balance againſt the opinion of the preſent age. As to the draperies, the antients muſt be ſtudied with caution, as has been already obſerv'd.

Inſtead of making *caricaturaes* of peoples faces (a fooliſh cuſtom of burleſquing them, too much uſed) painters ſhould take a face, and make an antique medal, or *bas-relief* of it, by diveſting it of its modern diſguiſes, raiſing the air and the features, and giving it the dreſs of thoſe times, and ſuitable to the character intended. Our nation is allow'd on all hands to furniſh as proper models as any other in the world, with reſpect to external grace and beauty: Nor perhaps can antient *Greece* or *Rome* boaſt of brighter characters than we.

Laſtly, a painter's own mind ſhould have grace and greatneſs, that ſhould be beautifully and nobly form'd.

GRACEFUL POSTURE and *proper actions* is the ſecond thing in a good picture, that is, that the true and natural motion of every thing be expreſs'd in the life and ſpirit of it, that is to quicken the life by art; as in a *king* to expreſs the greateſt majeſty, by putting or deſigning him in ſuch a graceful poſture, that may move ſpectators with reverence in beholding him.

And to draw a *ſoldier* in ſuch a poſture, as may betoken the greateſt courage, boldneſs and valour; and to repreſent a *clown* in the moſt aukward and clowniſh poſture; a *ſervant* or *page* in the moſt attentive and diligent poſture, *&c.*

And ſo in all your draughts, the inward affections and diſpoſitions of the mind may be moſt lively expreſt in the outward action and geſture of the body.

Now to attain the knowledge of this, you ought moſt diligently to obſerve the works of ſeveral famous maſters, and alſo to follow their examples, who were us'd to delight themſelves in beholding private perſons; as the actions, poſtures, and geſtures of wreſtlers, ſword-fighters, boxers at handy-cuffs, ſtage-players, the alluring glances and geſtures of curtezans, and in malefactors going to execution to obſerve the contracting of their brows, the motions of their eyes, and the motions of their whole bodies, to the end that they might expreſs them to the life in their drawings and works.

Take care likewiſe that you draw with a certain *looſeneſs* which is a great excellency in drawing, that is, that the body be not made ſtiff in any part; but that every joint may have its proper bendings, ſo that it may with the greater life expreſs the intention, that the figure may not ſeem lame and the joints ſtiff, as if they were not pliable or capable of bending; but that every joint and limb may have its proper freeneſs and looſeneſs, according as it may beſt ſuit with and become the poſture in which the figure is ſet.

GRANATE, a gem or precious ſtone, of a high red colour; thus call'd from the reſemblance it bears to that of the ſeed or kernel of a pomegranate.

Granates are either *oriental* or *occidental*; the *oriental* are brought from divers parts of the *Eaſt-Indies*; the *occidental* from *Spain*, *Bohemia*, and *Sileſia*.

The *oriental* are diſtinguiſhed by their colour into three kinds. The firſt is of a deep browniſh red, like black clotted blood; of which kind there are ſome as big as an hen's egg: the *ſecond* are very nearly of the colour of an *hyacinth*, with which it were eaſy to confound them, but for their ſuperior redneſs: the *third* ſort has a mixture of violet with their red, and is call'd by the *Italians*, *rubina della rocha*.

The *occidental Granates* are of a red colour, but of different degrees, according to the country they come from. Thoſe of *Spain* imitate the colour of the kernel of a pomegranate: thoſe of *Bohemia* have a golden caſt with their red, glittering like a live coal: thoſe of *Sileſia* are the darkeſt of all, and are ſeldom thoroughly tranſparent.

The *Granates* of *Bohemia* are the moſt valued of the *occidental* ones, and ſome prefer them even to the *oriental* ones. They are found near *Prague*, not in any particular mines, but are pick'd up by the peaſants in the fields from among the ſands and pebbles.

To make a GRANATE *colour in glaſs.*

The beauty of this colour is to expreſs the yellowiſh red of fire, when it is expos'd to the ſun.

Take cryſtal *frit*, and of *frit* of *Rochetta* each an equal quantity, mix them well, and to fifty pounds of theſe materials add half a pound of *manganeſe* of *Piedmont* prepar'd, half an ounce of *zaffer* prepar'd; mix them well with the *frits*; then put them by little and little into an earthen pot made red hot in the furnace, becauſe the glaſs is apt to riſe and run over.

After four days, the glaſs being well ting'd and purified, you may work it; you may increaſe or diminiſh the colour as much as you pleaſe, which depends on the diſcretion of the operator, who puts in the powders which ought to be put in orderly, that the matter be not ſpoiled.

To make a GRANATE *colour in glaſs of lead.*

The vivacity of this colour appears no leſs in glaſs of lead than in cryſtal, if it be carefully made.

Take ten pounds of cryſtal *frit*, and eight pounds of calx of *lead*, and after having added an ounce and a half of *manganeſe* of *Piedmont*, and a quarter of an ounce of *zaffer* both prepar'd (as is taught under the articles MANGANESE and ZAFFER) put the whole into a pot, heated in the furnace; twelve hours after caſt that melted matter into water, and take out the lead that remains behind in the pot.

Then put the matter again into the ſame pot, and let it ſtand ten hours to purify.

Then mix it well with the iron, and let the *fæces* precipitate; then ſee if the colour pleaſes you; then work it to what uſes you pleaſe, and you'll have a glaſs of lead of a fine *Granate* colour.

To make a paſte for an oriental GRANATE.

The *Granate* is very like the *carbuncle*, for being both expos'd to the ſun, they exhibit the colour of live burning coals, being between red and yellow, which is the true colour of fire.

There are ſeveral ſorts of *Granates*, both *oriental* and *occidental*, ſome deeper, others paler; but the jewellers know how to make them appear, by ſetting them on ſilver foils.

The way to imitate them is as follows:

Take two ounces of natural *cryſtal* prepar'd, and ſix ounces of *minium*, with ſixteen grains of *mangameſe* of *Piedmont*, and two grains of *zaffer* prepar'd; let the whole be pulveriz'd and well mixt together, and being put into a crucible, ſet them into the furnace with its cover well luted; there let them bake with the ſame precautions given as to the paſtes for other gems, and you will have a very fine *Granate* as reſplendent as the *oriental.*

A deeper oriental GRANATE.

This colour will not only be deeper, but alſo far fairer than the precedent.

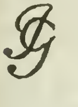
To make it, take two ounces of *natural cryſtal* prepar'd, five ounces and a half of *minium*, to which add fifteen grains of *manganeſe* of *Piedmont* prepar'd; and having pulveriz'd it, mix the whole together, and proceed in baking this paſte as directed for other paſtes, only take notice, you muſt here leave more empty ſpace in the crucible, becauſe this matter riſes more than the others, wherein care muſt be taken. Then will you have a deeper oriental *Granate* than the former, which you may poliſh, &c.

Another fairer GRANATE.

This paſte will be yet much fairer than the precedent, if you take to two ounces of *natural cryſtal* calcin'd and prepar'd, ſix ounces of *vermilion* or *minium* in fine powder, thirty-five grains of *manganeſe* of *Piedmont* prepar'd, and four grains of prepar'd *zaffer*, which being well pulveriz'd, mix together in a crucible, leaving a greater empty ſpace than in the other, by reaſon the matter riſes more than in the others; then lute the cover well, let it dry, and put it in the furnace to bake, as is directed as to other artificial gems, obſerving the ſame circumſtances noted on that ſubject, and you will have a very fine *Granate*, fairer than the reſt.

GRAND GUSTO, a term us'd by painters, to expreſs, that there is ſomething in the picture very great and extraordinary, calculated to ſurprize, pleaſe, and inſtruct.

Where this is found, they ſay the painter was a man of the *Grand Guſto*; and they uſe the word *ſublime* and *marvellous*, when they ſpeak of a picture much in the ſame ſenſe.



JAMES GRAND HOMME engrav'd the portraits of the *Hereſiarchs* and others, after *Rembrant*'s manner; us'd this mark. At other times he mark'd thus: *J. C. van Uliet.*

GRANITE, a ſort of marble extremely hard, rough and uncapable of taking a thorough poliſh; thus call'd, becauſe ſprinkled over as it were with a great number of little ſtains, reſembling great grains of ſand.

There are three ſorts of *Granites*; that of *Egypt*, that of *Italy*, and that of *Dauphiny*.

That of *Egypt* has browniſh or greeniſh ſpots on a dirty white ground. It is found in very large pieces, and is that chiefly us'd by the *Egyptians* in their obelisks and pyramids, or the tombs of their great men. There are columns of this ſtone above forty foot high.

The *Grinate* of *Italy* is ſofter than that of *Egypt*, eſpecially in the quarry, where it cuts with much more eaſe.

There is alſo a ſort of *green Granite*, which is a ſpecies of ſerpentine, ſpotted with green and white ſpots.

The *Granite* of *Dauphiny*, a quarry of which has been found, is only a very hard ſort of flint.

GRATEFUL REMEMBRANCE is repreſented in painting, by a young woman of a graceful countenance, crowned with a branch of juniper with berries on it, holding a great nail, and ſtanding between a lion and an eagle.

The juniper never withers, neither does the memory of benefits received; the juniper is ſaid to help the memory; the nail denotes the tenaciouſneſs of memory; the lion and eagle the remembrance of kindneſs received, the one is king of beaſts, the other of birds, and are both enemies to ingratitude.

G. R. } ſtands for *Guido Rheni* of *Bologna*, a celebrated
G. R. F. } painter.

G. R. B. C. F. ſignifies *Guido Rheni*, in the overthrow of the giants engrav'd by *Bartholomew Coriolano*.

GREEN is one of the original colours of the rays of light.

If urine, citron juice, or ſpirit of vitriol be caſt on a green ribbon, it becomes *blue*, by reaſon that the yellow of the green-ing weed is thereby exhaled and conſumed, ſo that nothing but blue remains behind.

Graſs and herbs, and even all vegetables, in places expos'd to the open air are *Green*, and thoſe in ſubterraneous places, or places inacceſſible to the air, white and yellow. Thus when wheat or the like germinates under ground, 'tis *white* or *yellow*; and what is in the open air, *green*, tho' this too is yellow before it be green.

Artificial Greens are rarely ſimple colours, but produced by the mixture of *yellow* and *blue*.

Two powders, the one *blue* and the other *yellow*, well mixt appear perfectly *Green*; tho' when view'd with a microſcope, we may obſerve a chequer of blue and yellow.

The dyers make divers ſhades or caſts of *Green*, as *light-green*, *yellow-green*, *graſs-green*, *laurel-green*, *ſea-green*, *dark-green*, *parrot-green*, and *celaden-green*.

All the *Greens* are firſt dyed in blue, then taken down with *woad*, *verdegreaſe*, &c. and then *green'd* with the weed, there being no one ingredient that will give green alone.

Mountain Green or *Hungary Green* is a ſort of greeniſh powder found in little grains like ſand among the mountains of *Kernanſent* in *Hungary*, and thoſe of *Moldavia*.

Though ſome are of opinion that this mountain green is factitious, and the ſame with what the antients call'd *flos æris*, prepar'd by caſting water or rather wine on copper red hot from the furnace, and catching the fumes thereof on copper plates laid over for that purpoſe; or by diſſolving copper plates in wine, much after the ſame manner as in making *verdegreaſe*.

Painters make uſe of this colour for a graſs *Green*.

It is ſometimes counterfeited by grinding *verdegreaſe* with *ceruſs*.

GREENS are allow'd by all perſons to depend upon the YELLOW and BLUE, and any *Green* colour, whatever you pleaſe, may be made with them.

Gamboge is one of the firſt yellows, which may be made to produce five or ſix ſorts of *Green* with *verdegreaſe*, according as the *gambooge* is in the greater or leſſer proportion; if it abounds, it will make a tolerable *oak green*, and being mixt with a greater quantity of *verdegreaſe*, it will make a fine *graſs Green*.

But the *yellow*, which ſome prefer before all others, is made of *French-berries*, which is either deeper or fainter, according as the liquor they are boil'd in is more or leſs ſtain'd by them; if it be very thin, it makes a good glaze all over the *verdegreaſe*, and as it approaches nearer to *Dutch-pink* or *gall-ſtone*, commands almoſt any colour we want; being agreeably mixt with the tranſparent *verdegreaſe*, and is ſtill tranſparent.

In like manner a *yellow*, drawn from the roots of *barberries*, and alſo that drawn from the roots of the *mulberry-tree*, will in a great meaſure produce the like effect, being mixt with the *tranſparent verdegreaſe.*

As for *verdegreaſe* it ſelf, it produces a fine *bluiſh Green*, flows readily in the pencil, and may even ſerve as an ink to write with.

The way of preparing the tranſparent VERDEGREASE *is as follows.*

Take ſix ounces of common *verdegreaſe* (the diſtill'd *verdegreaſe* will not anſwer this purpoſe ſo well) break it into little pieces, and boil it gently in a quart of white wine *vinegar*, keeping continually ſtirring it; when you perceive it to boil, add a little *tartar* broken, continuing ſtill to ſtir it, till you perceive the liquor of ſuch a colour as you would have it, *i. e.* till it is of a fine tranſparent *Green*, with a bluiſh caſt, which you may know by dipping in a bit of white paper.

Then pour it through a linen cloth into an open veſſel, and ſet it to cool, and when it is quite cold, keep it in a bottle for uſe; ſtop it cloſe, for being expos'd to the air, it will dry; but may be reduc'd again by common water.

This liquor ſhould be touch'd upon part of the lights and ſhades of a print, and the ſhades afterwards coloured with *ſap green.*

N. B. In the making of this *Green*, be ſure to make it ſtrong enough; for it cannot be ſtrengthened afterwards, without the trouble of boiling afreſh; but may at any time be rendered as faint as you pleaſe, by mixing common water with it.

SAP GREEN is a colour like that of an oak leaf, if it be us'd thin with common water, for this as well as the former wants no gum; but if it be us'd ſtrong, will produce as dark a green as any.

It will be proper to try colours firſt on a white *Dutch* tile, and by thinning it with water, you may render it of what ſtrength you pleaſe; and may brighten it very much, with adding to it a very little *verdegreaſe.*

There are two ways of making *ſap-green*, viz. Take the flowers of the blue *flag iris*, or *flower de luce*, and preſs them while there is any juice to be got from them; boil this gently in a glaz'd pipkin till it grows thicks; adding a little *alum* to it, and it will make a very uſeful and laſting *Green.*

N. B. You muſt obſerve this, that in the boiling of any juice, &c. of the colours before-mentioned, you muſt always do it in an earthen pipkin; for if it be boil'd in veſſels of metal, they will oftentimes change from the colours intended.

The ſecond way to make a *ſap-green* for the waſhing and illuminating prints, is to take the juice of *buckthorn-berries*; and tho' that juice ſimply will yield only *dark purple* of a very baſe hue; yet by adding *tartar* to it, it will change into a good *ſap-green.*

Either of theſe colours will mix with the liquid *verdegreaſe* above-mentioned, as well as make a delicate ſhade for it.

There is beſides theſe, another *Green* which is admired by ſome perſons, and that carries a good body with it, and with a degree of tranſparency too (as it may be made) but as it is commonly us'd, is a colour of a full body, and fit only for painting in miniature.

This is made by mixing *Dutch pink* with *indigo* to what degree of colour they pleaſe; but the high preparation of *French berries* with *indigo* (ſee the Article YELLOWS) is much to be preferr'd to *Dutch pink*, eſpecially as this anſwers all the intentions of *Dutch pink*, and carries a tranſparency with it, which the *Dutch-pink* has not.

IRIS GREEN, *to make.*

Take of the blueſt *flower de luces*, which are called otherwiſe *flag iris*, ſtrip off the upper or ſattin part of them, and keep only that; the reſt is not good for any uſe in painting, and pick even all the little yellow nerves, and throw them away too; then pound what you have thus pick'd in a mortar, throwing three or four ſpoonfuls of water upon it, according to the quantity of flowers you pound; but you muſt firſt have diſſolved in this water a little *alum*, and a very little *gum Arabick*; and having pounded them well together, ſtrain all through a cloſe cloth, and put this juice into ſhells, which dry in the air.

Another way.

Pound your *flower de luce* flowers, pick'd as before, in a mortar, and preſs out the juice into ſhells, and ſalt the juice in each ſhell with *alum* a little unequally, and you will by that means have *Greens* of different ſhades.

Another way.

Pick the flowers as directed in the firſt, then pound them, and put to them a little *alum water*, and throw in a little powder of quick lime, as if you were ſalting a ſallad. This will both change the colour and cleanſe it.

Another better way.

Pound *alum*, and having bruis'd *French* or *Avignion-berries*, mix them with water, and boil them either over a fire or an aſh heat, till the water becomes very yellow; then pound the *flower de luces* in a mortar, and pour a little of this yellow water upon them, according as you would have your *Green*, either *bright* or *ſad*; then ſtrain it through a cloth of goat's hair, for if it were paſs'd through linen, it would not be ſo good; and put the juice ſo ſtrained into large ſhells, and expoſe them to all the heat of the ſun; for if they are ſet in the ſhade, the *Green* will become mouldy or mothery, and prove too clammy.

Another way.

Mince the leaves of the *flower de luce* or *flag iris* very ſmall, and put them into a glaſs or earthen veſſel; or rather into a copper pot or pan (which is better) with ſome *alum* and *quick lime* powdered; let them ſtand to purify in this ſtate for ten or twelve days; and when they are rotten, ſqueeze them into ſhells.

The *Green* is more lively and rich when the *Green* is only pounded, and the juice ſqueez'd out at once, without giving them time to rot, having firſt ſalted them over with powdered *alum.*

The way of making a GREEN *with the flowers of* VIOLETS.

After the laſt method you may make a *Green* of the leaves of the *March violets*; but there muſt be a greater quantity of them, and this will be a deeper green than that of *iris*. You may, if you pleaſe, uſe *French-berries* bruis'd with *alum* inſtead of *lime*, which exceeds *lime* for changing *blue* into *Green.*

A *Green* may be laid with the flowers of *Panſies*, after the ſame manner.

To make BLADDER GREEN.

Pound the berries of the bramble call'd *Rhamnus* in a mortar, and ſprinkle upon them a little powdered *alum*; then preſs or ſqueeze out the juice, and put it up in a bladder, which tie cloſe, and leave it to dry till the *Green* is grown hard.

Obſervations on GREEN *colours.*

Verdegreaſe. It is a good *Green*, but ſubject to decay; being dry upon paper, it will be of a higher colour than when firſt laid on; therefore to preſerve it from that fault, diſſolve *ſap-green*, and it keeps its colour. You may make it fine, by extracting its tincture with ſpirit of *vinegar*, and then evaporating it to a drineſs, an ounce of this will be worth ten ounces of the other.

Verditer is a light *Green*, ſeldom us'd in any thing but colouring landſcapes, which ſeem afar off; and it is good for ſuch a purpoſe, becauſe it is inclining to blue.

Sap Green is a dark, dirty green, never us'd but to ſhadow other greens in the darkeſt places, or to lay upon ſome dark ground behind a picture, which ought to be of a dark *Green*; but you may do without this colour, for *indigo* mixt with *yellow-berries* makes juſt ſuch another colour.

Copper Green is an excellent tranſparent colour of a ſhining nature, if thickened with the ſun or over a gentle fire.

It is the moſt us'd of any green in waſhing of prints or maps, eſpecially in colouring of trees, ground, graſs, *&c.* for it is a moſt perfect *graſs Green.*

*The firſt Sea-*GREEN *colour for a tincture of Glaſs.*

The *Italians* give the colour of *ſea-green* to *Beryl*, which is a precious ſtone found at the foot of mount *Taurus* by the river *Euphrates*, which has the *green-blue* of the ſea.

It is found in the *Indies* of a colour ſomewhat paler, which makes it be call'd by different names; and when the colour is deeper, they commonly paſs for other precious ſtones: it is therefore the water expreſſes the colour.

This colour, which is one of the fineſt sky-colours, ought to be made of fine and well purified *cryſtal*, which the *Italians* call *bollito*; for if it be made of common glaſs, it is not ſo fair; nor muſt there be any *manganeſe* put to this colour.

Therefore to make it very fine and beautiful, take *cryſtal frit*, put it into a pot, ſet it in a furnace, where being well melted and clear, you muſt skim off the ſalt, which will ſwim on the top like oil, with an iron ladle; for if you ſhould not take it off, the colour would be foul and oily.

The matter having been well purified, you muſt add to every ten pounds of it or thereabouts, three ounces of the powder of *copper* calcin'd (ſee COPPER calcin'd) with an eighth part of *zaffer* prepar'd, alſo in powder, and well mixt both together.

In putting both theſe powders into the pot on the cryſtalline metal, you muſt do it by little and little, for fear the *cryſtal* riſing and ſwelling, ſhould run over, of which care muſt be taken, by keeping ſtirring it well all the while.

When this has been done, let the metal ſtand ſtill and ſettle for the ſpace of three hours, that the colour may incorporate; then ſtir it again, and you may then make a trial of the colour.

And it may be wrought twenty-four hours after the mixing of the powders, for by that time it will be well coloured; but the workman muſt firſt well mix the whole, for fear the colour ſhould not be precipitated to the bottom, which muſt always be well obſerved in all veſſels, wherein there are colours, and the doſes of the tinctures rightly proportioned.

*Another Sea-*GREEN *made with leſs charge to colour glaſs.*

Though this colour be inferior to the laſt, yet it has beauties ſufficient to ſatisfy both the ſight, and pay the pains of the workman. He muſt take the ſame preparation of ſcales of *copper* we have mentioned, and the ſame doſe of *zaffer*, with as much cryſtal made of *rochetta* of the *Levant* and *barilla* of *Spain* without any *manganeſe* either in the one or other, which has not been caſt into water, but well purified from its ſalt, obſerving in this place all we have noted to be done in other preparations of *cryſtal* and *ſea-green*, and you'll have a fine sky-colour or ſea-green fit for any uſe.

*Another Sea-*GREEN *far finer than the reſt.*

Neri ſeems to be the inventor of this new *ſea-green*, and to have experimented it; it is made with *caput mortuum* of vitriol of *Venus*, without any corroſive, which is a very curious preparation. This *caput mortuum* ought to be expos'd to the air for ſome days in a place where the ſun cannot come, where (by a magnetical virtue) it will attract the univerſal ſpirit which will reſtore to it again part of that it has loſt by extraction, and will become of a whitiſh *Green* colour; then pound it with the ſame doſe of *zaffer* prepared; put the whole in a pot filled with cryſtal metal very fine and well purified from its ſalt. Obſerving all we have noted on this ſubject, it will make an extraordinary *ſea-green.*

GREEN *to dye.*

I. *To dye an olive-*GREEN.

Take clear bran liquors, but ſtale, a ſufficient quantity, *alum* three pounds, *logwood* ground one pound; boil, and enter twenty yards of broad-cloth; boil two hours and a half, cool, and waſh it well. Take clear water a ſufficient quantity, *heddar* (commonly called *linge) heath ſtravel* or *fuſtick* as much as may make twenty yards of broad-cloth green; then take water a ſufficient quantity, *fuſtick* a pound, *cruſt madder*, *nut-galls*, *ſumach*, of each four ounces; boil, enter your cloth, handle it well; boil it an hour and a half, and ſo cool; add *copperas* four ounces, and enter your cloth again; boil half an hour; if you would have it ſadder, put in more copperas.

II. *To dye a Popingjay-*GREEN.

Take *water* a ſufficient quantity, *alum* two pounds, *logwood* ground eight ounces; boil, and enter twenty yards of broad-cloth; boil three hours, and make it a bright yellow; then draw it through a cold fat, and then waſh it.

III. *To dye a Sea-*GREEN.

Firſt make it a ſad-blue, then take water a ſufficient quantity, *alum* two pounds, *logwood* four ounces; boil, and enter your cloth; boil three hours; then waſh it, and make it a bright *yellow*; after which, draw it through a cold fat; then waſh it again.

IV. *To dye a Graſs-*GREEN.

Firſt make it a ſad blue, then take *alum* two pounds; boil and enter your cloth; boil three hours, and waſh it; then dip it into a good yellow dye.

V. *To dye a* French-GREEN.

Take clear ſtale *bran-liquor* a ſufficient quantity, *alum* two pounds and a half; boil, enter twenty yards of ſad blue broad-cloth; boil it two hours and a half, and waſh it well. Take water a ſufficient quantity, *heath ſtravel* or *fuſtick* ſufficient; boil well, put in your cloth, and handle it well; then take twenty ounces of *logwood* ground, and put into the dye alſo *copperas* four ounces (which binds the colour) and if you pleaſe, you may new-draw the cloth through a new fat, and handle it; ſo will it be finiſhed.

VI. *To dye a Verdegreaſe*-GREEN.

Take water a ſufficient quantity, make it as hot as you can endure your hand in it, in which put *verdegreaſe* two ounces in fine powder; enter twenty yards of ſtuff, and handle it well with your hands; let it lye in the liquor all night, ſtirring it ſome time, and then let it lie till it is deep enough.

VII. *To dye a Popinjan*-GREEN.

Take clear ſtale bran-liquor or ſowre tap-wort a ſufficient quantity, *alum* three ounces; boil, and enter twenty yards of broad-cloth, and boil three hours; cool your cloth, and waſh it well. Take fair *water* a ſufficient quantity, *neddar* (called alſo *linge*) or *heath ſtravel* a good quantity; boil it well, and take it out; then enter your cloth; boil it well, making it a bright yellow. Heat your blue fat, and put in *indigo* bruiſed ſmall four ounces, *madder* three ounces, *ground malt* two quarts, *new yeaſt* a quart; mix theſe things well together, keep them as hot as you can, and let it ſtand till it will ſtrike blue; then enter your cloth, and handle it well (to avoid ſpotting) till it is done, and ſo waſh it.

VIII. *To dye another* French-GREEN.

Firſt make your cloth a good blue, and take the ſame clean bran liquor you take for your greens a ſufficient quantity, *alum* three pounds, *logwood* ground four ounces; boil well, enter twenty yards of broad cloth, boil two hours and a half; after take it out, cool it, waſh it well. Take fair water a ſufficient quantity, good *neddar* or *heath-ſtravel* ſo much as will make your cloth a good green. Take fair water a ſufficient quantity, *logwood* ground a pound; let them boil, add a little urine; enter your cloth, boil a quarter of an hour; handle it, and ſo cool it. If you would have it a ſad-colour, enter it again, cool, and waſh it.

IX. *To dye a Foreſt*-Green.

Firſt make your cloth a good blue. Take clear ſtale *bran liquor* a ſufficient quantity, *alum* three pounds, *logwood* ground five ounces; let them boil, enter twenty yards of broad-cloth, handle, and boil it two hours and a half; take it out, cool, and waſh it. Take fair water a ſufficient quantity, and good *hedder* enough to make your cloth green; boil it well, then enter your cloth, and boil a ſufficient time. Take fair water a ſufficient quantity, *logwood* ground twenty ounces; boil them a quarter of an hour, cool a little; then enter your cloth, and handle it well, letting it boil about a quarter of an hour longer; after which, cool your cloth, and waſh it well.

X. *To dye a Graſs*-GREEN.

Firſt, make your cloth a bright blue, then take clear ſtale *bran-liquor* or ſowre *tap-wort* a ſufficient quantity, *alum* three pounds; let them boil, and enter twenty yards of broad-cloth; handle it, boil with a ſtrong fire for two hours, cool, waſh it well. Take water a ſufficient quantity, *hedder* or *heath-ſtravel* what you think fit; boil well for an hour; take forth the *hedder*, enter your cloth, handle it well, and let it boil a quarter of an hour; then cool, and put in a little urine; enter your cloth again, boil a quarter of an hour, cool, and waſh it well.

Note, That the different and various colours of *Greens* ariſe from the firſt blue being lighter or ſadder, or from the yellow being a deep or light colour.

XI. *A very good* GREEN *colour*.

Take *ſap-green*, bruiſe it, put water to it; then add a little *alum*, mix, and infuſe for two or three days.

XII. *To make a very good dye*.

Firſt, dye the cloth or ſtuff yellow, as we direct in the following; then put it into the blue dye deſcribed foregoing.

XIII. *To make a dark* GREEN *colour*.

Firſt dye your wool, yarn, ſtuff, or cloth of a blue colour, as we direct in the foregoing articles; then put it into your yellow dye as in the following, and it will be a dark *Green*.

XIV. *To dye a Popingjay*-GREEN.

Make a weak lixivium of *pot-aſhes*, ſuch as the country people waſh their clothes with; put into it *Indigo* a ſufficient quantity; then put in your things to be dyed (being firſt dyed yellow) let it boil, the longer the better, ſo will the colour be good.

XV. *A fair* GREEN *for miniature*.

Grind *verdegreaſe* with *vinegar* and a little *tartar*, then add a little *quick-lime* and *ſap-green*; grind all well together, and keep it in a ſhell, if it grows hard, with *vinegar*.

XVI. *To make a very fair* GREEN.

Take *verdegreaſe*, *tartar*, and *vinegar*, of each a ſufficient quantity; boil them all together, and it is done.

XVII. *Another* GREEN *for limning*.

Take *blackthorn-berries* gathered at the latter end of *Auguſt* when ripe, beat them, boil them eight or ten hours very gently;

then add water to make it thinner; ſtrain through a cloth as hard as you can, and add to the liquor *alum* in powder q. ſ. ſome add vinegar, but then it is longer a drying, and will be ruddy. You muſt keep it in a bladder in the ſhade, or in the chimney-corner, and it will keep.

XVIII. *To make Straw*-GREEN.

Boil it in water with *litmoſe* or *logwood*, and then it will be blue; then boil them in a lixivium of *pot-aſhes* and yellow *barberry-bark*, and they will be *Green*.

XIX. *To make a beautiful liquid* GREEN.

Take *verdegreaſe* one pound, *tartar* in powder eight ounces, *wine vinegar* a quart; mix all, infuſe for one night, and then boil till half is conſumed, and filter whilſt hot. When you uſe it, mix *gum ammoniack* and ſaffron to ſtiffen it; it will glaze over *buckthornberry-greens*. If you mix it with the juice of thoſe berries and *azure*, it will make ſeveral ſorts of *Green*.

XX. *To make* GREEN *balls*.

Take *buckthorn-berries* a pound, beat and boil them in ten pints of *water* till half is conſumed; ſtrain all through a cloth, and put into the liquor as much ceruſs in fine powder as will make it into a paſte, which form into little balls, and dry upon tiles; when dry, ſtiffen them with diſſolved gum. They will be better if you mix with them ſome *gum ammoniack*.

To dye woollen ſtuffs GREEN.

Firſt dye the ſtuffs *yellow* with broom or dye-weed, rinſe them well out, and while they are yet wet, paſs them through the *blue* dye, and work it, till it is the colour you would have it, either light or dark; ſo that ſeveral ſhades or ſorts of green may be dyed the ſame way (the ſtuffs having been always firſt tinged yellow).

A ſea GREEN.

For every pound of ſtuffs allow three ounces of *verdegreaſe* powdered, three pints and a half of *wine vinegar*, ſtir the *verdegreaſe* in it; paſs a pair of ſtockings through the liquor, and then hang them out without rinſing; when they are dry, wet them in the liquor again, and hang them up to dry again, ſo oft, till they are perfectly clear'd from all humidity.

A brown or iron GREEN.

Having hung clear rain water over the fire, put in for every pound of woollen powder'd *galls*, *gum*, *braſil* and *copperas*, of each an ounce and half, and *verdegreaſe* one ounce, boil them well together, ſtirring them very well; then boil the ſtuffs in it, till it is to your mind, and when it is cold rinſe it out.

To dye a laſting brown or iron GREEN.

For a piece of ſtuff of fifteen ells, take three quarters of a pound of *allum*, half a pound of *tartar*, two ounces of calcin'd *vitriol*; in theſe boil the ſtuff for half an hour, then rinſe it in clean water, and when it is dryed for the *blue*, you may throw away the *allum* ſuds.

How to blue it.

The ware being blued with *woad* of a light or deep brown according to your mind, then rinſe it again, dry it and prepare it for the following *yellow*. Boil eight pound of broom for half an hour, keeping it down in the kettle with a ſtick, *&c.* that it does not float on the top of the water, and when you uſe it, add to it two quarts of ſharp lie, half an ounce of flower of *brimſtone*, and an ounce of *verdegreaſe*; then dye the goods but only once, and it will be of a beautiful brown or *iron Green.*

If you pleaſe you may dye the ſtuff *Green* from a lead colour, and it will be deeper than the former, and laſt very well; but when it is dyed with brown wood and blued, it will be lighter; but not ſo firm as the other.

To dye linen GREEN.

Lay the linen a whole night in ſtrong *allum* water dry it well, then boil *broom* or *dyers-weed*, for the ſpace of an hour; take it out and put into the ſuds either half or a whole ounce of *verdegreaſe*, according to the quantity of the ware you have to dye; ſtir it well about with a ſtick, and then work the linen in it, once, twice or thrice, as occaſion requires, adding the ſecond and third time a quantity of *pot-aſhes* equal to an hen's egg; then work your linen the third time, and you will find it of a yellow colour; then dry it in the air, and afterwards throw it into the *blue-vat* (See BLUE) and that will produce the *Green* you deſire.

To dye thread of a laſting GREEN.

Boil three quarters of a pound of *Allum*, half a pound of *tartar*, in two quarts of ſharp *lye* for an hour, and in it ſoak the thread for three hours; keeping it hot all the while.

Then dye it yellow.

Put into the kettle eight pound of *broom* one pound of *carn marigold* flowers, half a pound of *crab-tree-bark*, that looks yellow and ripe; and ſuperadd two quarts of ſharp *lye*, when theſe have boil'd half an hour, then dye the thread in the liquor as deep a yellow as poſſible; but if you can procure *Spaniſh yellow*, an addition of three quarters of a pound of it will heighten the dye, and render it more laſting; for it is to be remembred, that all *yellows* that are deſign'd to be dyed *Green*, muſt be as deep as poſſibly they can be.

After this turn it GREEN *with* BLUE *dye.*

There are in this as in the foregoing receipt, four operations in dying a good *Green*, that you may make it either a light or a dark *Green* at pleaſure: for firſt, You may *blue* the thread with *woad*, or elſe with *indigo*, being firſt thrown into the *allum* ſuds, and afterwards into the *yellow*, and you will have a laſting *Green*. So that *Green* is to be dyed ſeveral ways.

Another green for thread.

Firſt fill the kettle with ſharpe *lye*, and then throw in a bundle of *broom*; boil them very well, and then pour off the liquor into a vat, and for every pound and half of thread, allow half an ounce of *verdegreaſe*, and half an ounce of *allum*; put theſe into a quart of *lye*, in which brown *braſil* wood has been boil'd; ſtir them together and pour them into the *broom* water; and in this mixt liquor, lay the thread in ſoak for one night, and you will find it well dyed.

GREENS *for* SILKS.

For every pound of *ſilk* take a quarter of a pound of *Engliſh allum*, two ounces of *white wine tartar* beaten ſmall, diſſolve them together in hot water, then put in the *ſilk*, letting it lie a whole night, then take it out and dry it; having done this, take a pound of *broom*, boil it in a pail and a half of water for an hour or better, then take out the *broom* and throw it away, and put in half an ounce of beaten *verdegreaſe* ſtirring it about with a ſtick; then put in the *ſilk* for a quarter of an hour, take it out and let it lie till it is cold; then put in one ounce of *pot-aſhes*, ſtir them about and put in the *ſilk* again, keep it there till you think it is yellow enough, then rinſe it out and let it dry; after which put it into the blue dye fat or copper, and let it remain there till it becomes *Green* and dark enough; then take it out and you will have a good *Green*, to be beaten and dry'd.

You may let it lie a longer or leſs while in the dye according as you would have the *Green* lighter or darker; for at firſt you will have but a faint *Green*.

Graſs GREEN.

Firſt dye your ſilk a pretty deep ſtraw colour, rinſe it clean and wring it cloſe together with ſticks; and then put about fifteen or twenty handfuls of skains into the blue dye copper; though you muſt take care that the ſtrength of the dye be proportioned to the quantity of ſilk; and that you do not put in too many skains at once.

When it has boil'd enough take the kettle off, and let it ſtand for an hour; after which time you may work it again, and do the ſame every hour, allowing the ſame interval; but you muſt be very careful that one handful does not lie longer in than another, and when it is taken out of the copper, let it be very well cool'd, rins'd and ſtrongly wrung with ſticks, and afterwards dry'd.

To dye parrot or parroquet GREEN.

This being ſomething lighter than the other, muſt be boil'd in weaker ſuds than the other, and as ſoon as it is dyed, muſt be wrung and dry'd as the other.

To dye green finch or canary bird GREEN.

This muſt be dyed as the *Green*; but you ought to add a little *Provence wood* to the laſt ſuds, according to the quantity of the ſilk; after which it muſt be boil'd in the blue copper, wrung out and rinſed.

To dye olive GREEN.

This alſo muſt be dyed as the *Green*, only the laſt ſuds muſt be encourag'd with a little *Provence wood* ſuds, till it is deep enough; then wring it out, *&c.* as above.

To dye a celadon or celandine GREEN.

This colour being very light and bright, muſt be dyed as the ſea *Green*, and boil'd in weak ſuds, and managed as the *Green*, and dry'd.

To dye a ſea GREEN.

This colour alſo being very light, muſt be perform'd as the lemon colour, and thrown into blue ſuds, then wrung out and dry'd.

Another ſea GREEN.

For every pound of ſilk take three ounces of *verdegreaſe* pounded ſmall, put it into good *wine* or ſharp *vinegar* to diſſolve, let it lie a whole night in it, in the morning ſet it over the fire and make it hot, ſtirring it about with a ſtick; and then put in the ſilk, (but take care not to let it boil) and let it remain two hours, or one, or half an hour according as you would have the colour a deep, middling or light *Green*; then put ſome boiling hot water into a fat or tub, to which add half an ounce or an ounce of ſoap, and make a lather; when it froths it is ready; then hand the ſilks in it, let them drop afterwards, and rinſe them in river water, beat them very well, and dry them.

JOHN GREENHILL, was a gentleman deſcended from a good family in *Salisbury* where he was born, he was diſciple to Sir *Peter Lely*, whoſe manner in a ſhort time he ſucceſsfully imitated, and became a great proficient in crayon draught as he afterwards did in painting; he failed very little of his maſter's excellencies, who firſt neglected, and then became jealous of him as a dangerous rival; for he never let him ſee him paint but once, and that was by ſtratagem. Mr. *Greenhill* had long had a deſire to ſee Sir *Peter* manage his pencil, but ſo ſhy was that great artiſt of revealing his myſtery, that he would never lend him the leaſt aſſiſtance all the while he was with him; which made Mr. *Greenhill* after he had left him, have recourſe to a wile to procure that which he muſt have otherwiſe deſpaired of. He procured Sir *Peter* to paint his wife's picture, through which means he had an opportunity to ſtand behind and ſee what he did; which being greatly to his ſatisfaction on a double account, he made his maſter a preſent of twelve broad pieces, and ſo took the picture away with him, having thus obtain'd his end; he in a little time became exceeding famous for face painting; inſomuch, that had he not died young, *England* might have boaſted of a painter, who according to his beginnings, could not have been much inferior to the very beſt of foreigners.

GREY *to dye.*

1. *Silver Grey colour.* Take *water* a ſufficient quantity, of *nut-galls* bruis'd ſmall two ounces, *tartar* bruis'd three ounces, boil them, enter twenty yards of ſtuff or cloth, *&c.* handle and boil an hour and half, cool it; then put in *copperas* a ſufficient quantity, enter your cloth again at a boiling heat, handle it, boil a quarter of an hour, and ſo cool, if you would have it ſadder, put in more *copperas.*

2. *To dye a light Grey colour.* Take *water* a ſufficient quantity, *nut-galls* bruis'd ſmall four ounces, *white tartar* bruis'd ſmall four ounces, make them boil; then enter twenty yards of broad cloth, and handle it, boiling an hour and half, cool your cloth, and put in *copperas* an ounce and half, enter your cloth again and handle it, boil it a quarter of an hour, and cool it; if you would have it ſadder, put in more *copperas.*

3. *To dye lead colour.* Take *water* a ſufficient quantity, *nut-galls* bruis'd ſmall one pound, *madder* half a pound, make them boil, enter twenty yards of broad cloth, boil an hour, take it out and cool it; then add to the liquor *copperas* four ounces, boil and put in your cloth again, handle it a quarter of an hour, after, which take it forth and waſh it.

4. *To dye another lead colour.* Take *water* a ſufficient quantity, *nut-galls* bruis'd ſmall a pound, *red-wood* ground two ounces, boil all together, enter twenty yards of broad cloth, and handle it, and boil it an hour and half, take up your cloth and cool it; after which put in *copperas* eight ounces, enter your cloth again at a boiling heat, and handle it and let it boil half an hour, and cool it, if you would uſe more *copperas*; *Note*, that the quantity that dyes twenty yards of broad cloth, will dye forty yards of ſtuff.

5. *To make a fair ruſſet colour.* Take *water* a ſufficient quantity, *Braſil* ground one ounce, boil it an hour, *grains* in powder half an ounce, boil and enter your wool, yarn, cloth, *&c.* boil an hour, cool and add *copperas* four ounces, enter your matter again, boil and cool, *&c.*

6. *Another ruſſet colour.* Take *water* a ſufficient quantity *Braſil* in powder, *red-wood*, of each half a pound, *nut-galls* two ounces, *copperas* four ounces, mix and boil an hour, enter the matter you would die; let it lie twenty four hours.

7 *To dye a dark* GREY. For every pound of woollen ware, uſe a quarter of a pound of *copperas*, and a quarter of a pound of *brown wood*, (or *walnut-tree wood).*

To finiſh it. Take two ounces of *brown-wood*, and half an ounce of *copperas.*

A ſilver GREY.

Boil the goods with two ounces of *allum*, and two ounces of *pot-aſhes*, for every two pound of woollen; which let lye in it one whole night, and then boil it.

Then to finiſh it. Diſſolve two ounces of *ſal armoniack*, two ounces of *litharge of ſilver*, two ounces of bright *ſoot*, a dram of *cryſtal of tartar*, together for one night; boil them an hour, and paſs the woollen ſtuffs through it.

To dye ſtuffs, &c. *a* LAVENDER GREY.

Heat a proper quantity of clean rain water in a kettle, and for every pound of ſtuff, take an ounce of blue *lac* beaten ſmall, and half an ounce of pounded *galls*, and the ſame quantity of *vitriol*; boil them together, and put in the ſtuffs, and boil them for half an hour.

This dye is proper for ſlight ware, as ſtockings and coarſe ſtuffs; but not for the better ſort.

To dye ſilk a good GREY.

This you may prepare as the tawney dye, and after you have wrung out, rinſed and beaten it, if it be browned, it becomes a good *Grey.*

To make ſilk a brimſtone WHITE.

Boil the ſilk as for pearl colour, with the addition of a little blue *lye*, and for every pound of ſilk, add ſix ounces of ſoap; rinſe the ſilk in it, wring it very well out of the dye, and hang it upon very white poles, and after that in a cloſe room, ſetting a ſhovel or pot of fire under it; upon which ſtrew *brimſtone*, ſhut the room cloſe, and the next morning dry it in the air.

GRIEF is repreſented in painting by a man naked, manacles upon his hands, and fetters on his feet, encompaſſed with a ſerpent gnawing his left ſide, and he ſeeming to be very melancholy.

The fetters denote the intellects that diſcourſe and produce irregular effects, being ſtraitned by perplexity, and cannot attend to their accuſtomed operations; the ſerpent ſignifies misfortunes and evils, which occaſion deſtruction, which is the chief cauſe of *Grief.*

GRINDING *Glaſs* for looking glaſſes, *&c.* is perform'd after the following manner.

In the new method of working large plates of *Glaſs* for looking glaſſes, *&c.* by moulding, and as it were caſting them ſomewhat after the manner of metals, that you will find under the article GLASS. The ſurface being left rough, it remains to be ground and poliſh'd.

In order to this, the plate of *Glaſs* is laid horizontally on a large ſtone in the manner of a table, and to ſecure it the better plaſtered down with *plaſter* of *Paris*, &c. that the effort of the workman or of the machine us'd in grinding, may not diſplace or looſen it. This ſtone table is ſuſtain'd by a wooden frame, the bottom or baſe of the *Grinding* machine is another rough *Glaſs*, about half the ſize of the *Glaſs* deſign'd principally to be ground; on this upper *Glaſs* is a plank of wood cemented to it, and upon this are ſet weights to promote the triture or wearing off the ſurface of the rough caſt *Claſs*.

This table or plank is ſometimes faſtened to a wheel, which gives it a motion.

This wheel, which is at leaſt five or ſix inches diameter, is made of a very hard but light wood, and is wrought by two workmen plac'd againſt each other, who puſh and pull it alternately; and ſometimes when the work requires it, turn it round.

By ſuch means, a conſtant mutual attrition is produc'd between the two glaſſes; which is aſſiſted by water and ſands of ſeveral kinds, which is caus'd to paſs between them; ſand being apply'd ſtill finer and finer, as the *Grinding* advances, and at laſt *emery* is us'd.

As the upper or incumbent *Glaſs* poliſhes and grows ſmooth, it is ſhifted from time to time, and others put in its place.

But only the largeſt ſize glaſſes are thus wrought with a wheel or machine, the middling and ſmaller ſorts being wrought by the hand.

GROSSNESS is repreſented in painting, by a groſs corpulent woman, holding an olive branch in her right hand bearing fruit without leaves, in her left a crab.

The olive branch denotes fatneſs; the crab as much ſubject to fatneſs, where the moon increaſes either from the particular quality of the moon, or elſe becauſe when it is full moon; the crab has by the light a fairer opportunity to procure its food.

GROUNDS *for a* LIMNING *or painting after the life.*

The *Ground* behind a picture in miniature, *&c.* is commonly *blue* or *crimſon*, imitating a curtain of *ſattin* or *velvet*; if it be to be *blue*, you muſt lay it on as follows; waſh *bice* till it is very pure and clear, and temper a quantity in a ſhell ſufficient for your *Ground*, and let it be thoroughly moiſt and well bound with *gum*. Then with a ſmall pencil go about with the ſame colour, the *pourfile*, that is the utmoſt ſtroke and ambient ſuperficies of the picture; having done this, take a larger pencil, and therewith waſh over ſomething carefully the whole *Ground* that you deſign to cover with a *blue*, ſomewhat thin and wateriſh, and then with a pretty large pencil full of colour and flowing lay over that place with a thick and ſubſtantial body of colour, which you had only waſh'd over before; in the doing of this you muſt be very quick, keeping the colour moiſt that you have laid, not ſuffering any part to dry till you have covered the whole. See SATTIN and VELVET.

If you would have your *Ground* a crimſon like ſattin, then trace out where and in what places you will have theſe ſtrong and hard lights and reflections to fall, which are ſeen in *ſattin* or *velvet*, with *Indian lake*; there lay your lights with a *lake* that is thin and wateriſh, and while it is yet wet, lay the deepening and hard ſtrong ſhadows with a ſtronger and darker colour of *lake* thick ground; cloſe by the other lights. The beſt way for imitation is to have a piece of *ſattin* before you to imitate.

GROUP, [in *painting* and *ſculpture*] is an aſſemblage or knot of two or more figures of men, beaſts, fruits or the like, which have ſome apparent relation to each other.

In a good painting it is neceſſary, that all the figures be divided into two or three *Groups* or ſeparate collections.

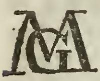
Thus they ſay, ſuch a thing makes a *Group* with ſuch and ſuch others of different nature and kind.

A *Group* has ſomewhat in it of the nature of a ſymphony or concert of voices; as in the one the voices muſt ſuſtain each other, in order to fill the ear with an agreeable harmony from the whole; whence if any part were to ceaſe, ſomething would neceſſarily be miſs'd; ſo in *Groups*, if the parts or figures be not well balanc'd, ſomething will be found diſagreeable.

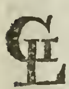
There are two kinds of *Groups*, or two manners of conſidering *Groups*, with reſpect to the *deſign* and to the *clair obſcure*; The firſt is common both to works of painting and thoſe of ſculpture.

Groups with reſpect to the *deſign* are combinations of divers figures, which bear a relation to each other, either upon the account of the *action* or of their *proximity* or of the effect they have. Theſe we conceive, in ſome meaſure, as repreſenting ſo many different ſubjects, or at leaſt ſo many diſtinct parts or members of one greater ſubject. See DESIGN.

Groups with reſpect to the *clair obſcure*, are bodies of figures, wherein the lights and ſhadows are diffus'd in ſuch manner, that they ſtrike the eye together, and naturally lead it to conſider them in one view.



MATTHEW GRUNEWALD, ſirnam'd of *Aſchaffemberg*, painter and engraver, after the manner of *Albert Durer*, us'd this mark. He liv'd in the year 1510.



LEONARD GUALTIER, us'd this mark.

G. S. F. ſtands for *Gio* or *(John) Sirani Fecit.*

GUIL. *Baurn*, 164. ſtands for *William Baur*, painter to the Emperor.

GUM, a vegetable juice, that exſudes through the pores of certain plants, and there hardening into a tenacious tranſparent maſs.

Gum is properly one of the juices of the bark, it is drawn thence by the heat of the ſun, in the form of a glutinous humour; and is by the ſame cauſe afterwards inſpiſſated, concocted and rendred tenacious.

The character by which *Gums* are diſtinguiſh'd from *reſins* and other vegetable juices, is that they are diſſoluble in water, and at the ſame time inflammable by fire.

In the general, they are more viſcid and leſs friable, and generally diſoluble in any aqueous menſtruum; whereas *reſins* are more ſulphureous, and require a ſpirituous diſſolvent.

Gums are different according to the different trees, roots, *&c.* out of which they ouze; they are by ſome authors diſtinguiſh'd into aqueous and *reſinous Gums*. The firſt are ſuch as are diſſolvable in wine, water and the like fluids; the ſecond are thoſe only diſſolvable in oil.

There are various ſorts of *Gums* of which I ſhall here mention only the chief, as

Gum Anima } is a *reſinous* juice, ouzing from a tree, which
Gum Animi } is by the *Portugueſe* call'd *courbari*, growing in divers parts of *America*.

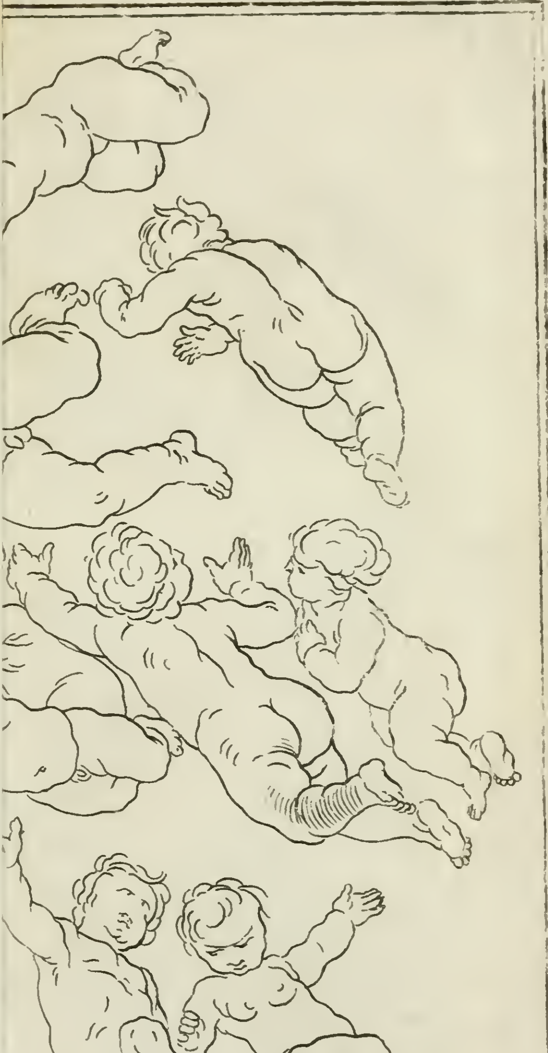
This *Gum* is very hard and tranſparent, of an agreeable ſmell not unlike *amber*, it neither diſſolves in water nor oil, and conſequently is not properly accounted a *Gum*.

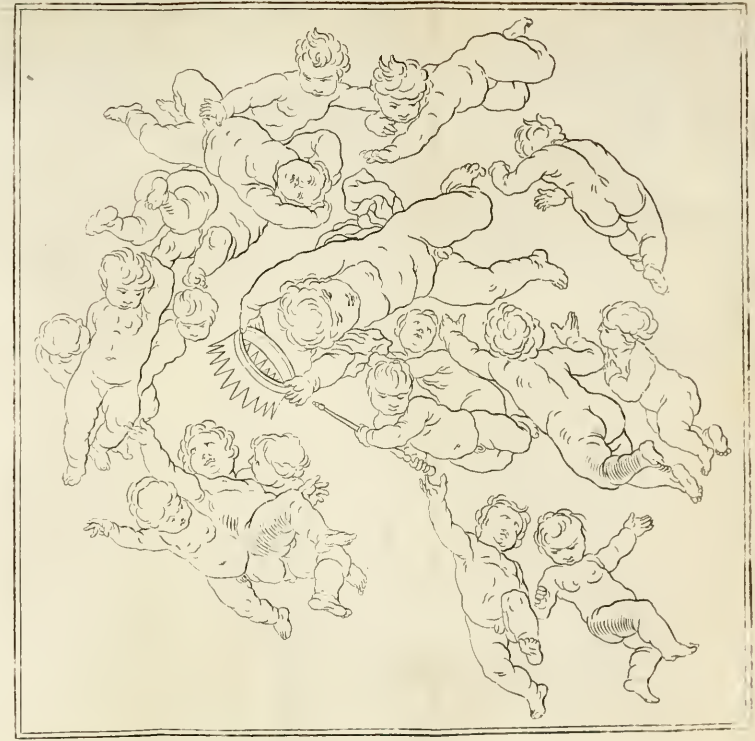
Inſtead of this *Gum copal* is frequently ſubſtituted.

Gum Arabic, is the juice of a little tree growing in *Egypt*.

It is very tranſparent and glutinous upon the tongue, almoſt inſipid to the taſte, and twiſted ſomewhat in the form of a worm.

Gum Gutta } is a *reſinous Gum* brought from the kingdom
Gutta Gamba } of *Siam*, &c. in large pieces faſhion'd not un-
Gamboche } like ſauſages, hard, brittle and very yellow.





It ouzes from inciſions made in a prickly kind of ſhrub, climbing up the neighbouring trees.

It ſerves to make a yellow colour for painting in miniature.

Gum Senegal is the *Gum* ordinarily ſold by druggiſts for *Gum Arabic*, which it reſembles very nearly both as to form and virtue.

It is either white bordering on the yellow, or of a deep *amber* colour, tranſparent, *&c.* it ouzes out of a prickly ſhrub, common enough in *Africa*, and is brought to us from *Senegal.*

GUMMO RESIN }
GUM ROSIN } is a hardened juice of a middle *reſin*; being both diſſoluble in *aqueous menſtruums* like a *Gum*, and in oily ones, like a *reſin.*

Such are *maſtic*, *camphire*, *ſtorax*, &c.

GUMS. The chief of all is *Gum Arabic*, that which is white, clear and brittle; the *Gum water* of it is made thus.

Take *Gum Arabick*, bruiſe it, and tye it up in a fine clean linen cloth; then put it in a convenient quantity of pure ſpring water in a glaſs or earthen veſſel, letting the *Gum* remain there till it is diſſolv'd; which being done, if the water be not ſtiff enough, put more *Gum* into the cloth; but if too ſtiff, add more water.

Of which *Gum water* have two ſorts by you, the one ſtrong and the other weak; of which you may make a third at pleaſure.

But if *Gum Arabick* is not to be had, uſe the following preparation of ſheep's leather or parchment.

Take the ſhreds of white ſheep skins, (which are to be had at the glovers) or elſe cuttings of parchment one pound, of conduit or running water two quarts; boil it to a thin gelly, then ſtrain it whilſt hot through a fine ſtrainer, and ſo uſe it.

Gum lake is made with *whites* of *eggs*, beaten and ſtrain'd a pint, *honey*, *Gum Hedera*, of each two drams, ſtrong wort four ſpoonfuls, mix them and ſtrain them with a piece of ſponge, till they run like a clear oil, which keep in a clean veſſel, till it grows hard.

This *Gum* will diſſolve in water like *Gum Arabick*, it is a good ordinary varniſh for pictures.

Gum Hedera }
Gum of Ivy } it is gotten out of *Ivy*, by cutting with an ax a great branch thereof climbing upon an oaken tree, and bruiſing the ends of it with the head of the ax; at a month's end or thereabouts, you may take from it a very clear, and pure fine *Gum*, like oil.

This is good to put into *gold ſize*, and other colours for theſe three reaſons.

1. It abates the ill ſcent of the *ſize.*

2. it will prevent bubbles in *gold ſize*, and other colours.

3. Laſtly, it takes away the fat and clamminefs of colours.

Gum Ammoniacum is a foreign *Gum*, and ought to be bought ſtrain'd. Grind it very fine with juice of *garlick*, and a little *Gum Arabick water*, ſo that it may not be too thick; but that you may write with it what you will.

When you uſe it, draw what you will with it, and let it dry, and when you gild upon it, cut your *gold* or *ſilver* to the faſhion you have drawn with the *ſize* or *gum*; then breathe upon the *ſize*, and lay the *gold* upon it, gently taken up, which preſs down hard with a piece of wool, and then let it be well dry'd; when it is dry'd, ſtrike off the looſe *gold* with a fine cloth; and ſo what was drawn will be fairly gilded, if it were as fine as a hair. It is call'd *gold ammoniack.*

G. V. S. G. ſignifies, *Van Scheendel Fecit*, and V. V. *Buytuvech inv.*

H.

HAIR, [to paint in miniature] lay on *biſtre*, *oker*, *white* and a little *vermilion*, but when it is dark, you muſt uſe *black* inſtead of *oker*; and then ſhade with the ſame mixture, diminiſhing from the *white* and finiſh with the *biſtre* alone, or mix'd with *oker* or *black*, by fine thin ſtrokes, very near to each other, waving and curling them, according to the turn of the *Hair.*

You muſt alſo refreſh the lights with fine turns of *oker* or *orpiment*, or *white* and a little *vermilion*; after which blend away the lights into the ſhades, working ſometimes with *brown*, ſometimes with *pale.*

As for the *Hairs* upon and round the fore-head, through which the fleſh is ſeen, they muſt be coloured with the colour of fleſh, ſhading and working beneath, as if you deſign'd there ſhould be none; then ſhape them and finiſh them with *biſtre*, and refreſh the lights as you did the reſt.

HAIR of women and children is coloured with ſimple *brown oker*, and heightened with *maſticote*; the ſame in the *Hair* of men, only making it ſadder or lighter as the life requires.

Hair which is black may be coloured with *ſoot*, or *lamp black*, but it will abide no heightening.

Children's *Hair* is ſometimes laid with *brown oker*, and *white*, and heightened with the ſame; and ſometimes with *allum.*

Sometimes alſo it is done with *light oker*, and deepened with *brown oker*, and heightened with *maſticote* ſimple.

Old women's *Hair* is coloured with *brown oker* and *black*, heightened with *brown oker* and *white.*

GREY HAIRS are coloured with *white*, *black* and *biſtre*, nd finiſh'd with the ſame mixture, but ſtronger, heightening e lights with a very pale *blue* and *white*.

But the matter of the greateſt importance is to ſoften the ork, to run the tints into one another, as well as the *Hair* on nd about the face into the fleſh, taking eſpecial care that you ork not dry or hard, and that the out-lines of the fleſh be ot cut.

You muſt accuſtom your ſelf to mix with *white*, but juſt as ou want more or leſs of it; for the ſecond colouring muſt be lways a little deeper than your firſt, except it be for ſoftenng.

The various colourings may be eaſily produc'd by taking more r leſs *red*, *blue*, *yellow* or *biſtre*, whether for the firſt colouring r for finiſhing.

The colouring for women ſhould be bluiſh, for children a litle red, both freſh and gay; and for the men it ſhould incline o *yellow*.

Of dying Hair colours.

1. *To dye Hair colours.* Take water a ſufficient quantity, *llum* three pounds, with which *allum* twenty yards of broad oth; and after which make it of a bright *yellow* with *fuſtick*. hen take water a ſufficient quantity, *nut-galls* in powder two ounds, *madder* in powder four ounces, let it boil an hour; then ke it out and cool it; after which put in *copperas* eight ounces aking it boil, put in your cloth, handle it well about a quarter f an hour; take it out and cool it, if it is not ſad enough; put in again, for the oftener you take it out and put it in, the lder it will be.

2. *Another Hair colour.* Take water a ſufficient quantity, *lum* three pounds, enter twenty yards of broad cloth, boil it ree hours; take it out and waſh it well, and make it a bright *low*. Take *nut-galls* eight ounces, *madder* four ounces made all, put them in your cauldron and let them boil; enter your oth and handle it well, boil one hour, then take it out and ol it; add to the former things *copperas* eight ounces, let it l, put in your cloth again, handle it well, and repeat this rk till it is ſad enough.

;. *A Hair or cloth colour.* Take water a ſufficient quantity, *madder*, *nut-galls*, *ſumach*, *red-wood* ground, of each a nd, boil them, enter twenty yards of broad cloth, boil an r, ſadden with *copperas* ſix ounces.

.. *Another Hair colour.* Take water a ſufficient quantity, *galls* eight ounces, *fuſtick* one pound, *madder* four ounces, *wood* two ounces, make them boil, enter twenty yards of &c. and boil two hours, cool your cloth, and put in *cop-*

peras four ounces; enter your cloth again, handle and boil it a quarter of an hour, then cool it, put in more *copperas*, if you would have it ſadder.

5. *Another Hair colour.* Take water a ſufficient quantity, *fuſtick* eight ounces, *nut-galls* bruis'd ſmall ſix ounces, *red-wood* ground four ounces, make them boil; then enter your cloth, *&c.* and boil two hours and a half, afterwards cool and ſadden it with *copperas* eight ounces. This will ſerve for twelve pounds of wool, yarn, cloth, *&c.*

Another.

There are ſeveral different ſhades of this colour.

Some do it with *alder-bark*, *Walnut-ſhells*, *green-oak chips*, (otherwiſe they crumble like duſt.)

They uſe for the firſt ſuds two pounds and a half of *allum*, and one pound of *tartar*; boil them for an hour and a half, and then pour off the water.

Others firſt prepare the ſtuffs with *galls* and *copperas*, and dye them *red*, and then *yellow*; to redden them they uſe ſeven pound of *madder*, and after that paſs them thro' the *yellow* copper, and after that, through the *copperas* and *gall* ſuds; ſo that whatever colours you would dye, either light *reddiſh* or *yellowiſh*, you muſt order it according to a pattern the workman is to follow.

Another.

SOOT *dye or* HAIR *colour is prepar'd as follows:* Firſt *allum* the goods and dye them *yellow*; then dye them to an aſh-colour with *galls*, *brown-wood* and *madder*, then add a little *copperas*, and you will have a *Hair* colour.

Take notice that this is proper for woollens, but not for linens.

The ſeveral MIXTURES *for* SHADOWING HAIR.

1. *White* and *Roman oker* for *light Hair.*
2. *White* and *yellow oker* for *lighter Hair.*
3. *White* with *ruſt* and *Roman oker.*
4. *Light pink* with *ſea-coal* and *yellow oker.*
5. *Dark pink* with *ruſt* and *Roman oker.*
6. *Pink* with the *beſt ruſt* and *gall-ſtone.*
7. *Florence pink* with *lake* and *burnt-ivory*, a good ſhadow for *Hair and face.*
8. *White* with *umber* and *yellow oker* for *light Hair.*
9. The laſt mixture with more *umber* and *cherry-ſtone-black*, for a *deeper Hair.*
10. *Yellow oker* with *umber* and *cherry-ſtone-black*, for a *dark Hair.*
11. The laſt mixture with *umber* and *cherry-ſtone-black*, for a *darker Hair.*

To do theſe things artificially, you may temper the natural urs with your pencil upon your pallat, being firſt plac'd in er; then wet your pencil in water, and temper upon the co- you intend to make uſe of firſt in your mixture; then rub r pencil on a clean place of your pallat, leaving part of the ur upon the place.

And in the ſame manner take from as many of the other as ll be directed for ſuch and ſuch temperatures or mixtures. thus;

Dip your finger in water, and temper or mix your colours as did with your pencil, placing your colours ſo mixt upon ur pallat in order.

HANDLING. By this term is underſtood the manner in ich the colours are left by the pencil upon the picture; as the nner of uſing the pen, chalk, or pencil in a drawing, is the dling of that drawing.

This conſider'd in itſelf abſtractedly, is only a piece of me- nicks, and is well or ill as 'tis perform'd with a curious, ex- t; or heavy, clumſey hand; and that whether 'tis ſmooth or gh, or however 'tis done; for all the manners of working pencil may be well or ill in their kind, and a fine light hand een as much in a rough, as in a ſmooth manner.

It is delightful to ſee a freedom and delicacy of hand in paint- g, as in any other piece of work; it has its merit. Though ſay a picture is juſtly imagin'd, well diſpoſed, truly drawn, great, has grace, or the other good qualities of a picture, withal, that 'tis finely handled; is as if one ſhould ſay a man irtuous, wiſe, good natur'd, valiant, or the like, and is alſo ndſome.

But the handling may be ſuch as to be not only good abſtract- conſider'd, but as being proper, and adding a real advantage the picture; and then to ſay a picture has ſuch and ſuch good perties, and is alſo well handled (in that ſenſe) is as to ſay, an is wiſe, virtuous and the like, and is alſo handſome, and fectly well bred.

Generally if the character of the picture is greatneſs, terrible ſavage, as battles, robberies, witchcrafts, apparitions, or even portraits of men of ſuch characters, there ought to be em- y'd a rough bold pencil; on the contrary, if the character is ice, beauty, love, innocence, *&c.* a ſofter pencil, and more iſhing is proper.

'Tis no objection againſt a ſketch if it be left unfiniſh'd, and ith bold rough touches, though it be little, and to be ſeen near, d whatſoever its character be; for thus it anſwers its end, the painter would after that be imprudent to ſpend more e upon it. But generally ſmall pictures ſhould be well wrought.

Jewels, gold, ſilver, and whatſoever has a ſmart brightneſs, require bold rough touches of the pencil in the heightnings.

The pencil ſhould be left pretty much in linen, ſilks, and whatſoever has a gloſſineſs.

All large pictures, and whatſoever is ſeen at a great diſtance, ſhould be rough; for beſides that 'twould be a loſs of time to a painter to finiſh ſuch things highly, ſince diſtance would hide all that pains; thoſe bold roughneſſes give the work a greater force, and keep the tincts diſtinct.

The more remote any thing is ſuppos'd to be, the leſs finiſhing it ought to have. I have ſeen a fringe to a curtain in the back-ground of a picture, which perhaps was half a day in painting, but might have been better done in a minute.

There is often a ſpirit and beauty in a quick, or perhaps an accidental management of the chalk, pen, pencil or bruſh in a drawing, or painting, which 'tis impoſſible to preſerve if it be more finiſh'd, at leaſt 'tis great odds but it will be loſt; 'tis better therefore to incur the cenſure of the injudicious, than to hazard the loſing ſuch advantages to the picture. *Apelles* comparing himſelf with *Protogenes* ſaid, perhaps he is equal, if not ſuperior to me in ſome things, but I am ſure I excel him in this; I know when to have done.

Fleſh in pictures to be ſeen at a common diſtance, and eſpecially portraits, ſhould (generally ſpeaking) be well wrought up, and then touch'd upon every where in the principal lights and ſhadows, and to pronounce the features; and this more or leſs, according to the ſex, age, or character of the perſon, avoiding narrow or long continued ſtrokes, as in the eye-lids, mouth, *&c.* and too many ſharp ones; this being done by a light hand, judiciouſly gives a ſpirit, and retains the ſoftneſs of fleſh.

In ſhort, the painter ſhould conſider what manner of *Handling* will beſt conduce to the end he propoſes, the imitation of nature, or the expreſſing thoſe rais'd ideas he has conceiv'd of poſſible perfection in nature, and that he ought to turn his pencil to; always remembring that what is ſooneſt done is beſt, if 'tis equally good upon all other accounts.

There are two miſtakes very common; one is, becauſe a great many good pictures are very rough painted, people fancy that it's a good picture that is ſo. There is *bold painting*, but there is alſo *impudent painting*. Others on the contrary judge of a picture not by their eyes, but by their fingers ends, they feel if it be good.

Thoſe appear to know little of the true beauties of the art, that thus fix upon the leaſt conſiderable circumſtance of it, as if it were all, or the principal thing to be conſider'd.

The cartoons, as they are properly no other than colour'd drawings, are handled accordingly, and extremely well. The fleſh is generally pretty much finiſh'd, and then finely touch'd upon. There is much hatching with the point of a large pencil upon a prepar'd ground. The hair is made with ſuch a pencil for the moſt part.

Leonardo da Vinci had a wondrous delicacy of hand in finiſhing highly, but *Giorgion* and *Correggio* have eſpecially been famous for a fine, that is a light, eaſy, and delicate pencil. You ſee a free bold *Handling* in the works of *Titian*, *Paolo Veroneſe*, *Tintoretto*, *Rubens*, the *Borgognone*, *Salvator Roſa*, &c. *Malteſe* had a very particular manner, he painted chiefly *Turkey*-work'd carpets, and left the pencil as rough as the carpet itſelf, and admirably well in its kind. For works at a great diſtance, *Lanfranc* had a noble manner of *Handling*; as particularly in the *cupola* of St. *Andrea della Valle*, which is in *Freſco*, and where the colours are flung on with a ſpunge inſtead of a pencil or a bruſh; not for a whim, but as moſt proper to the purpoſe; and an eye (for example) appears not near, as one rude ſpot, but as it ought at its intended diſtance.

Perhaps no man ever manag'd a pencil in all the ſeveral manners, better than *Van-Dyck*.

Of drawing HANDS *and* FEET.

It requires ſome time to practiſe drawing of *Hands* and *Feet*, before you proceed to the drawing of whole bodies; becauſe it will be too difficult to enter upon them, till you have been pretty well practis'd in the drawing the ſeveral limbs and parts of them, eſpecially the *Hands* and *Feet*, which are the moſt difficult parts of the body to draw, next to the face, and by practiſing of theſe you will be able more readily and eaſily to attain the leſs.

And it is certainly moſt commendable exactly to draw a *Hand*, which hath ſo many varieties of poſture and action, which will be found very difficult to imitate in every one of them, in the ſpirit and life of them, without ſome lameneſs, or imperfection.

The actions and poſtures of the *Hand* are ſo various, that no certain rule can be given for the drawing them; but you may take this for a general rule; that when you firſt draw it with charcoal, you are not to draw it perfectly, that is to ſay, to make all the joints, or veins, or other things to appear but either lightly or faintly; to touch out the bigneſs of the *Hand*, and the manner of turning it with faint touches, and not with hard ſtrokes; and when you have done that as it ſhould be, part the fingers aſunder or cloſe according to your pattern, with the like faint ſtroke; then mark that place where any of the fingers ſtand out from others, and make a faint reſemblance of it.

When you have done this, if you find your draught to be right, proceed to draw it more perfectly; and make the bending of the joints, the wriſt bone, and other principal parts more exactly.

Then in the laſt place, go over it again, and draw every ſmall bending or ſwelling of the fingers, and make the nails, knuckles and veins, ſo many of them as appear, and every thing elſe that you can diſcern.

Obſerve this rule in all your drawings, that before you ſet about drawing your draught with *black-lead* or other things, you muſt blow off the looſe duſt of the coal from your drawing, or faintly whisk over your drawing with a feather, that ſo you may leave it ſo faint, as but juſt to perceive your ſtrokes; and by this means you will the better ſee how to draw it over again with *black-lead*, or elſe you would not be able to diſcern your ſtrokes.

As for the proportion of a *Hand*, you have it ſet down in the plate (here inſerted) by lines and figures, which ſhew the equalities of proportions in a *Hand*, and how many equal meaſures there are in it, which it will not be improper for you to acquaint your ſelf with, that you may by that means know when a *Hand* is well proportioned with juſt and equal diſtances.

But you ought not to forget this, that according as the *Hand* turns one way or other, the proportions muſt be fore-ſhortened, according as they appear to the eye; ſo much as the *Hand* turns away from our ſight, ſo much it loſes of its ordinary proportion, and is made to ſhorten to that proportion, that the eye judges of it; nay, ſometimes a whole finger, ſometimes two or three, or more are loſt to our ſight, by the turning of the *Hand* another way from us, and ſo they muſt be wholly left out, and not made.

The proportion of the *Hand* conſiſts of three meaſures, of the noſe, of which you are to make three equal prick'd ſquares, mark'd perpendicularly 1, 2, 3, the loweſt of which ſquares is divided into two equal parts, thereby to adjoin a half, making a third part unto that baſe, mark'd alſo 1, 2, 3, which is given to the ball of the thumb and fore-finger near to the ſaid thumb, raiſing a prick'd line perpendicularly up unto the top of the right *hand* angle of the ſquare, mark'd above with I, making a prick'd quill, within which the fore-finger is contain'd, the length and top of which exceeds the upper joint of the middle-finger; that being divided into three equal parts, the two equal joints or the two upper parts ſhall be of equal height to the upper part of the little-finger, as appears in the figure of the *Hand*, repreſented at B, and the thumb ſhall not exceed the ſecond or middle joint of the fore-finger.

Plate. XXIII.

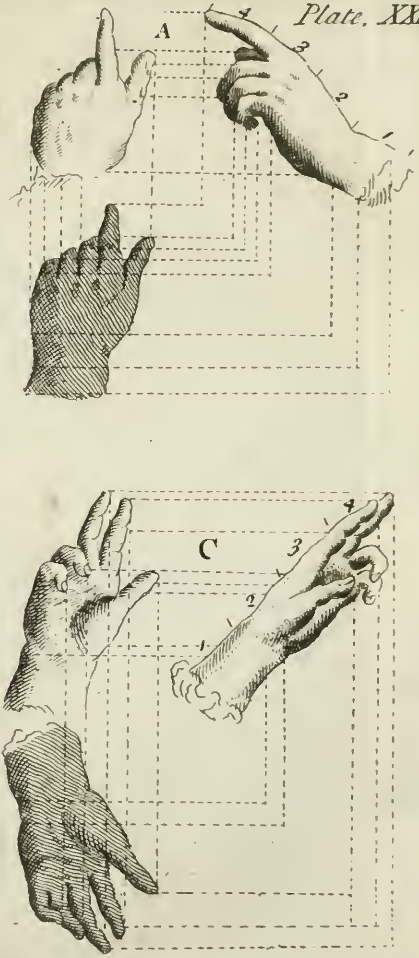


Plate. XXIII.

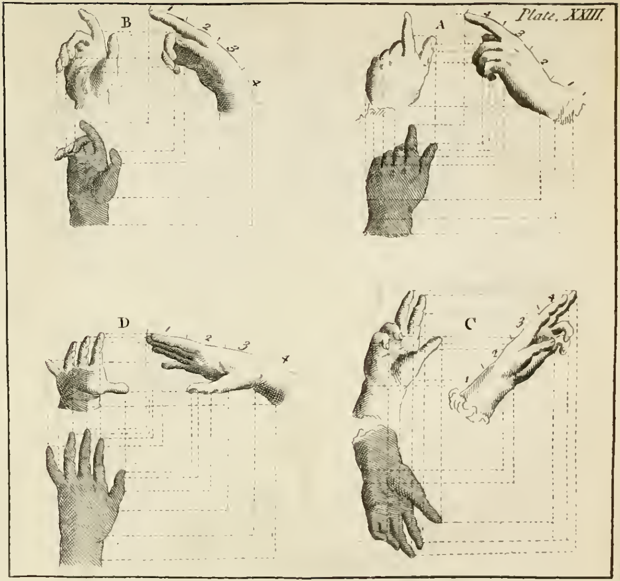


Plate. XXIV.

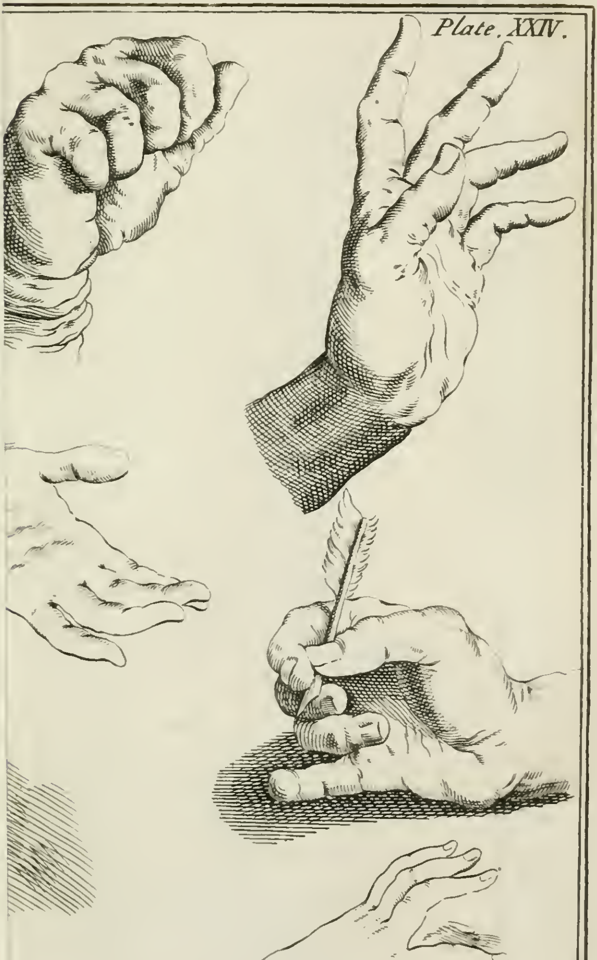
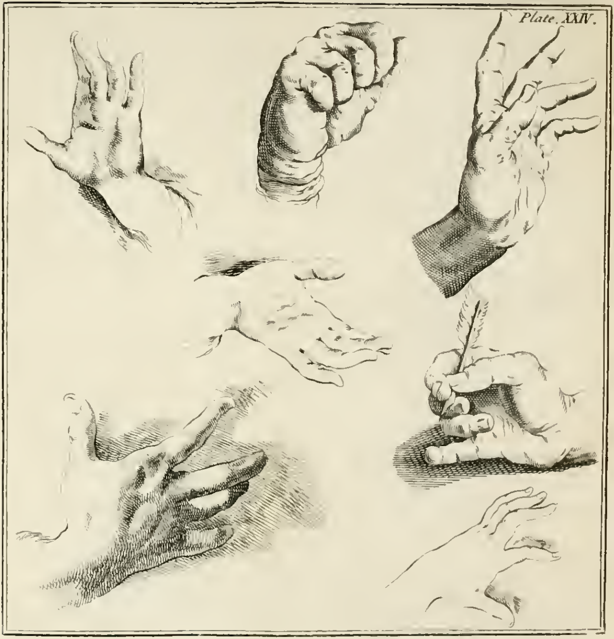


Plate. XXIV.



Then there remains a fourth meaſure for the wriſt, which is the meaſure of the noſe, the baſe or lower part of which is divided into four parts, which ſhall ſerve for *Hands* ſeen on the ſide.

The ſame meaſures are obſerv'd, as well in the *Hand* ſeen without, as on the back, mark'd A.

To fore-ſhorten the *Hands*, you muſt firſt draw the perpendicular lines from the *Hands* ſeen ſlopewiſe, or aſide, mark'd with their proportions and meaſures 1, 2, 3, 4, (See plate) upon which the ſun ſhining, would ſo caſt them down to the diagonal mark'd at the end with O, and then carry the reflection of them levelly, from the interſection of thoſe perpendicular lines in the diagonal aforeſaid, until you come under the place of the fore-ſhortened *Hands*, thereby to get the ſhadow, from which ſhadow you muſt perpendicularly raiſe perpendicular lines, till they meet and interſect level lines, drawn alſo from the firſt *Hand* ſeen aſide, ſo will the interſections of the ſaid laſt nam'd level lines, and raiſed perpendiculars, give the foreſhortened *Hands* A B C D E, even as the eye would ſee the ſideways or ſloping *Hands*; and ſo will the workman ſee the *Hand* fore-ſhortened, by the means of the ſaid ſhadow.

HANDS [in painting in miniature] and the other nudities are to be done as the faces, obſerving to make the tip or end of each finger a little redder than the reſt.

Your work having been coloured and ſtippled, you muſt go over all the ſeparations of the parts, with fine touches of *carmine* and *orpiment* together, as well in the ſhades as in the lights; but ſtronger in the firſt, and then handle them away into the reſt of the fleſh,

ADRIAN HANNEMAN was both a hiſtory and face-painter, born at the *Hague*, diſciple to one *Raveſteyn*, and came to *England* in the reign of King *Charles* I. He was employed for ſome time under *Mytens* principal painter to that King, and continued here ſixteen years; at the end of which he went for *Holland*, and there drew the Princeſs Dowager Royal, his Highneſs the Prince of *Orange*, and all the court. He alſo drew that piece repreſenting peace in the States-chamber at the *Hague*, alſo the picture of two uſurers telling their gold, for Mynheer *Van Wanwing*; while he was doing this laſt piece, he happened to want money, whereupon ſending to the perſon he was at work for to borrow ſome, it was accordingly ſent him. When the picture was finiſhed, it was carried home, and the price demanded paid for it; but when Mynheer thought to have the money he had lent (having ſlip'd the opportunity of ſtopping it out of meer generoſity) he was anſwered, that the gold that he had borrowed was all put into the picture (meaning that which the miſers were telling) and that he muſt expect no farther ſatisfaction. This painter died abroad about forty-ſix years ago.

HAR. *Holbenius* ſignifies *Holbenius* of *Harlem.*

HARDENING is the act of communicating a greater hardneſs to a body than it already has.

The *Hardening* and tempering iron and ſteel, makes a conſiderable article in the mechanical arts.

There are divers ways of effecting it; as by the hammer, quenching it when hot in cold water, caſe-hardening, *&c.*

To *Harden* and temper *Engliſh*, *Flemiſh*, and *Swediſh* iron, they give it a pretty high heat, then ſuddenly quench it in water to make it very hard. *Spaniſh* and *Venice* ſteel need only to have a blood-red heat, and then be quenched.

The workmen ſometimes grind *indigo* and *ſallad-oil* together, and rub the mixture upon it with a woollen rag while it is heating, and let it cool of it ſelf.

If the *ſteel* be too hard or brittle for an edge, ſpring, or pointed inſtrument, it may be taken down or rendered ſofter, thus: Take a piece of grind-ſtone or whet-ſtone, and rub hard on the work, to take the black ſcurf off it, and to brighten it; then let it heat in the fire, and as it grows hotter, the colour will change by degrees, coming firſt to a light goldiſh colour, then to a darkiſh goldiſh colour, and at laſt to a blue colour. Chuſe which of theſe colours the work requires, and quench it ſuddenly in water.

Hammer HARDENING is moſtly us'd on iron or ſteel plates, for ſaws, ſprings, *&c.*

Caſe HARDENING is perform'd after the following manner: Take cow-horn or hoof, dry it well in an oven, pound it to powder; put as much *bay-ſalt* as of this powder into ſtale urine, or *white wine vinegar*, and mix them well together; then cover the iron or ſteel all over with this mixture, and wrap it up in loam or plate-iron, ſo that the mixture may touch every part of the work; then put it in the fire and blow the coals to it, till the whole lump has attained a blood-red heat, but no higher, and then take it out and quench it.

HARMONY [in painting.] Some mention a *Harmony* both in the *ordonnance* and *compoſition*, and in the *colours* of a picture.

In the *ordonnance* it ſignifies the union or connexion between the figures, with relation to the ſubject of the piece.

In the *colouring* it denotes the union or agreeable mixture of different colours.

HARPOCRATES (the God of ſilence) was repreſented by the antients in the form of a young child, holding one of his fingers cloſe to his lips, as a ſign of *taciturnity*. Some again

Plate XXV.

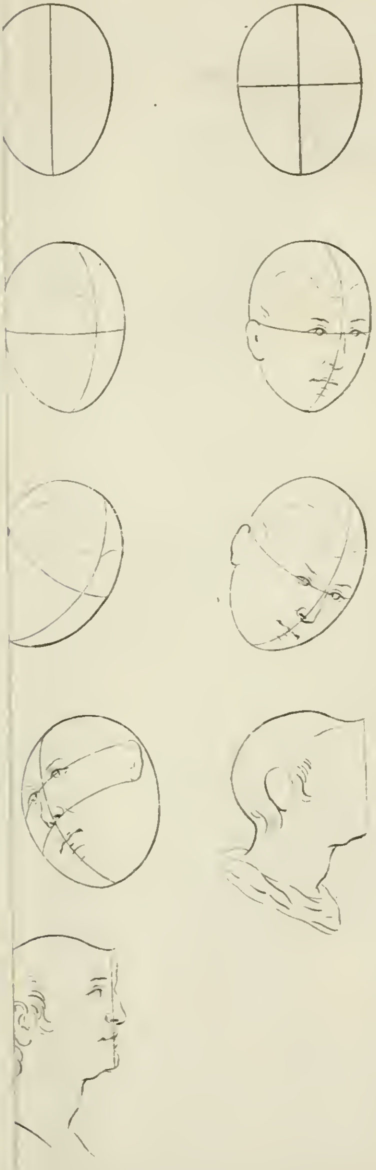


Plate XXV.

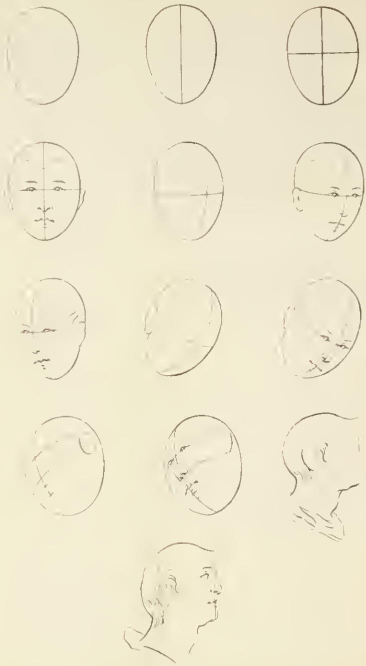


Plate XXVI.

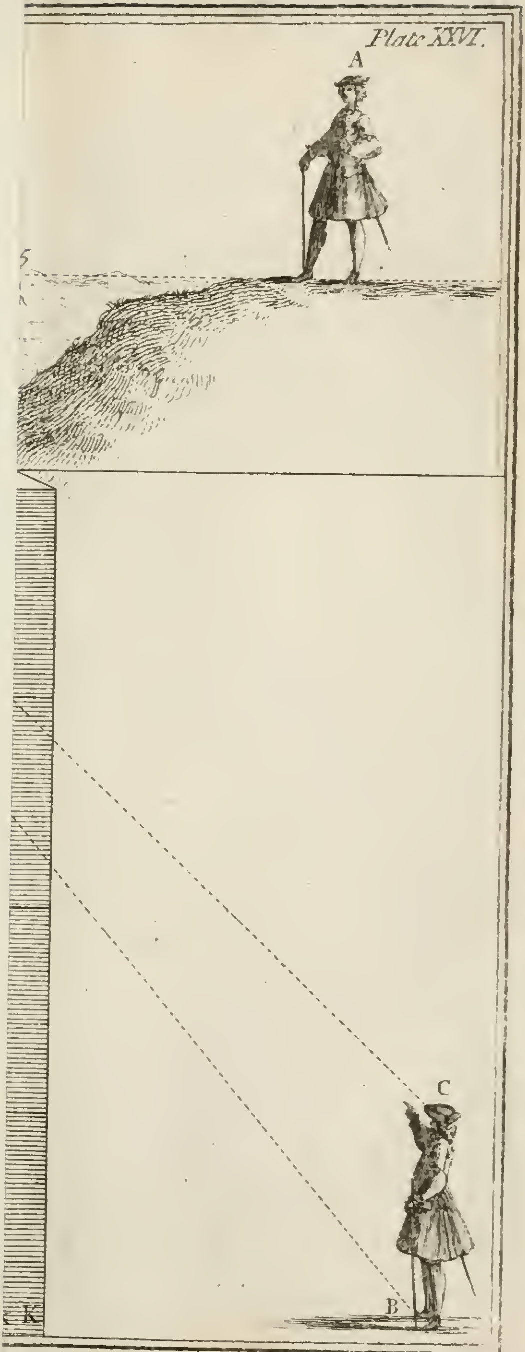
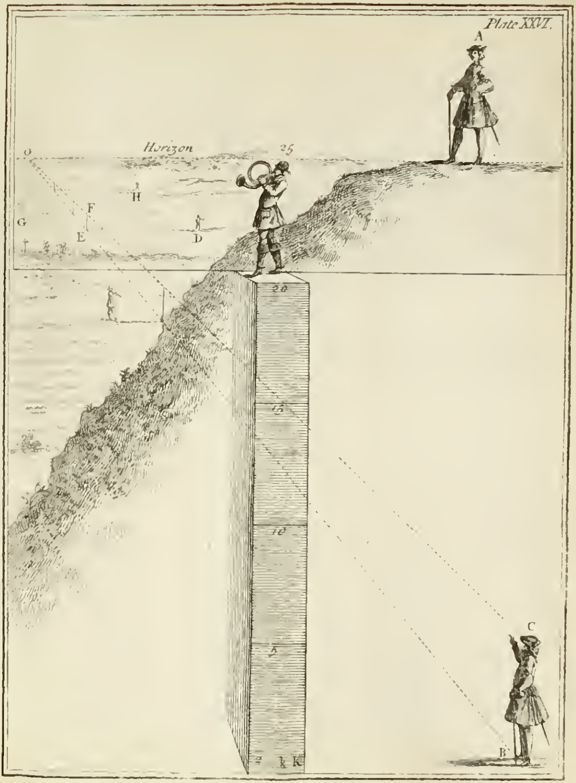


Plate XXVI.



pourtrayed him without any face at all, all covered with the skin of a wolf, painted full of eyes and ears.

To intimate that, it is good to ſee and hear much, but to ſpeak little.

HATCHING } in deſigning, engraving, &c. ſignifies the
HACHING } making of lines with a pen, pencil, graver, or the like, and the interſecting or going acroſs thoſe lines with others drawn over them another way.

The depths and ſhadows of draughts are uſually form'd by *Hatching*.

HATCHMENT is a popular name for an *atchievment*, or an *eſcutcheon* over a gate, door, or ſide of an houſe, with the coat armour of a perſon deceaſed.

HATRED is an emotion of the ſoul, caus'd by the ſpirits, which incite the ſoul to deſire a ſeparation from ſuch objects as are repreſented as hurtful to it.

Hatred is engendered out of *jealouſy*, and as *Hatred* and *jealouſy* are ſo near related to each other, and their external motions almoſt alike, there is nothing to obſerve of this paſſion particular or different from *jealouſy*, for which ſee the plate.

This paſſion wrinkles the forehead, the eye-brows are ſunk down and knit, and the eye-ball is half hid under the eye-brows, which turn towards the object; it ſhould appear full of fire, as well as the white of the eye and the eye-lid; the noſtrils are pale, more open, and more marked than ordinary, and drawn backwards, ſo as to make wrinkles in the cheeks; the mouth is ſo ſhut as to ſhew that the teeth are cloſed; the corners of the mouth are drawn back, and very much ſunk down; the muſcles of the jaw appear ſunk; the colour of the face is partly enflam'd and partly yellowiſh; the lips pale or livid.

It is obſerved, that in *Hatred* the pulſe is unequal, lower, and ſometimes quicker than ordinary; one feels heats mixt with I know not what ſharp and pungent burnings in the breaſt, and the ſtomach ceaſes to perform its functions.

JOHN HAYLES was a good face-painter, contemporary and competitor with Sir *Peter Lely*, was ſo excellent a copyiſt, that many of the portraits which he did after *Van Dyck* paſs at this day for originals of this prodigious man. He died in *London* in the year 1679, and lies buried in St. *Martin*'s church.

H. B. This mark was us'd by *Hans Burkmair*, who engraved thirty-ſix hiſtorical pieces relating to the empire. *Hans Broſanier*, who liv'd in 1538, and *Horatio Borgiani* of *Rome*.

H. *Bol.* ſignifies *Hans Bol*, i. e. *John Bol* in certain landſcapes.

H. C. ſignifies *Hans Leifrink* in certain plates of birds, and parties of hunting in friezes.

The PROPORTIONS *of a Body of ſeven* HEADS.

The length from the crown of the head to the ſole of the foot is ſeven times the length of the *head.* This is a large head, and all the members and limbs are anſwerable to it, *viz.* ſtrong, ſturdy and rais'd.

Yet the antient *Grecians* painted only the goddeſs *Veſta* in this proportion, it being grave and matron like.

But this proportion may be given to any other goddeſs which has any kind of grave or ſolid reſemblance, as alſo to the more ſtay'd and antient ſort of women, to propheteſſes, *Sibylls* and ſuch like, whom it would be a great overſight to draw in a ſlender and delicate proportion; as alſo to draw a prophet in the proportions of a young man.

To draw a child of ſix heads, you muſt divide the whole length of the body into ſix parts, of which the head muſt be one.

To draw a child of five heads, the whole length of the body muſt be divided into five parts, of which the head muſt be one.

To draw a child of four heads, the whole length of the body muſt be divided into four equal parts, of which the head muſt be one.

The proportion of a young man of nine heads. Note, that the proportion of a ſlender young body of nine *heads* is from the top of the head to the end of the *chin* a ninth part of the whole length, and thence back again to the root of the hair a tenth or eleventh part; this ſpace is divided into three equal parts, whereof the firſt makes the forehead, the ſecond the noſe, the third the chin; but it muſt be granted, that in a face, which is the eleventh part (by reaſon of a certain tuft of hair, which is uſually expreſs'd) the forehead becomes lower by a third part; which rule the antient *Grecians* obſerv'd, as is to be ſeen in their ſtatues.

The proportion of a woman of ten heads in length is thus meaſured: between the top of the head and the ſole of the foot is ten times as much as the chin, and the top of the head, and thence to the privities is half.

The proportion of a woman of nine heads, is from the top of the head to the *chin*, a ninth part of the length; the face may be either a tenth or eleventh part, at pleaſure. This being divided into three equal parts, the firſt gives the forehead, the ſecond the noſe, and the third the chin. See the article FACES.

To draw a HEAD *in profile or ſideways.*

The manner to make this *head* by juſt and ſafe rules, is thus:

Firſt form an equal triangle, in what poſition you pleaſe, turning the triangle to make the face upon one of the three ſides, be it which it will, either upwards or downwards, higher or lower, dividing that ſide into three equal parts, the one to ſerve from the lower part of the *hair*, to the lower part of the *forehead*; the ſecond from thence to the under part of the *noſtrils*; the third to the lower part of the *chin*.

Theſe three lines being fram'd, draw a little crooked ſtroke with a *coal* or *chalk*, out of the right line that may reach from the top of the forehead to the *eye-brow*; from whence draw away the ſlope line, bending at the end.

To place the *noſe*, either long, ſhort, groſs, or thin, as you would have it, ending that at the ſecond diſtance, where the *noſtrils* end; then ſubdivide the remaining third part in the midſt, where the mouth ſhould be plac'd for the parting of the upper and under lips; then frame the *chin*, having regard to the perpendicular line, that it fall not out of the middle of the *chin*, adjoining thereto the under chin down to the *throat pit*.

Then with the other two dividing lines, the one from the top of the forehead downwards (and ends in the midſt of the back-part of the ear) the other proceeds upwards from the *chin*, aſcending till that meet with the ſuperior deſcending line, whoſe interſection directs the *ear*, that the circumference thereof ſtretch not too far.

Thus take the upper part of the *forehead*, and deſcribe a great circular line about to form with that the roundneſs of the *head* unto the nape of the *neck*, keeping the proportion that nature teaches; and from thence downwards form the reſt of the *neck*, obſerving to make the tip of the ear not to exceed the lower part of the *noſtrils*.

So you may have the head in what poſition you pleaſe, ſo this abandon not the other two lines, each concurring in their due points.

To draw a HEAD *with a fore-right face.*

To do this, form a perfect *oval*, which divide in the midſt with a line the longeſt way (*i. e.* a perpendicular line) divide this line into three equal parts, allowing a fourth of one of the three parts for the hair in the *forehead*; the firſt for the *forehead*, the other for the *chin*.

In the midſt of theſe the mouth is to be formed, always taking care that the eyes be in one line, and the croſs-line of the *noſe* and *mouth* muſt always be correſpondent to the croſs-line, where the eyes are plac'd; and the eyes muſt be the length of one eye diſtant from the other, and their inward corners muſt be perpendicularly over the outſide of the noſtrils; but to make the ears in a fore-right face proportionable, they muſt be much foreſhortened by *foreſhortening*, by which is meant that the eye does not ſee the full latitude of it.

The proportion of the length of the *ear* is from the *eye-brows* to the bottom of the noſtrils, and then it is to join the neck with the hair in ſuch a manner as may be moſt agreeable to the eye.

Of the HEAD *in foreſhortening.*

Make a circular draught, with the aſpect upwards or downwards, as in the fore-right head, where the traverſe lines are ſtrait, but theſe go circular; for if the heads fly upwards, the traced ſtrokes and diviſions muſt be rais'd with caution, that the *ears* and *eyes* fall not out of their due points.

Meaſures or HEIGHTS, *and diminution of elevated* FIGURES.

As to the diminution of figures, when plac'd on high, we are to take our meaſures in proportion for ſuch as are to be rais'd in paintings, when they be plac'd on mountains, houſes, or above the clouds in the air. The two rules we have now to give will render the method extremely eaſy.

For the firſt, I ſuppoſe the man A to be ſix foot; which height I ſet off ſeveral times on a perpendicular B over the baſe-line 6, 12, 18, *&c.* draw lines to the head of the figure A; then ſetting one point of the compaſs at letter A, with the other deſcribe the arch C D, and the interſection that arch makes with the rays, are the meaſures to be given the figures.

Thus, if you would have a figure appear forty-two foot high above the ſame baſe-line; take E D, which cuts the two laſt rays, and ſet it off to F, which is forty-two feet above the ſame baſe A B.

If another be required thirty feet high, you muſt take the diſtance G H, which cuts the rays 30, 36, and gives the height of the figure P, and ſo of the reſt.

The main point is the approaching or receding of the line B, which muſt always be the diſtance between the ſpectator and the object, *viz.* thirty feet, or thereabouts. See PLATE, fig. 1.

For the ſecond rule; inſtead of the line B, us'd in the firſt figure, the diviſion is made from ſix feet to ſix on the baſe-line I T. The two firſt points 1 and 6 are to be drawn to the point of ſight K. Thus between the two rays I K and 6 K, you have the meaſure of ſix feet, which is the heighth to be given the figures. Then from all the other diviſions, 12, 18, 24, 30, *&c.* draw lines to the point of diſtance L; and in the interſections made by the ray 6 K, draw little parallels to the baſe line between the rays I K and 6 K. Theſe parallels will give the heights of figures unequally high, but at the ſame diſtance;

which may be prov'd by comparing the meaſures of the firſt method with thoſe of the ſecond. See PLATE, fig. 1.

If it be ask'd how much each figure is diminiſhed from the firſt, which is ſix foot high, you need only to take the height of the figure required in your compaſſes, and ſet it off on your little ſcale M in the firſt figure, and your queſtion is ſolv'd.

Thus having taken the height of the figure B, and ſet it on the ſcale M, it gives four feet, which ſhews that a figure ſix feet high, rais'd thirty feet will appear to be but four feet. The heights and diminutions of the reſt are found by the ſame operation, provided the diſtance be the ſame with that of theſe. If the diſtance be chang'd, the proceſs muſt begin anew.

The figures V, X, Y, which are in the clouds in the ſecond figure underneath, are of the ſame height and proportion as in the firſt figure. They are only here added to ſhew, that tho' the method be different, the effects are the ſame.

What has been ſaid as to the heights and diminutions of figures on the baſe line AB in the firſt method, and IT in the ſecond, muſt be obſerved in proportion as they are ſunk further behind; and the higheſt muſt have the ſame relation to thoſe under ground which are in the ſame line as this F P to that A. Thus in the ſecond rule, if over againſt the left figure N there were another figure O placed on a tower forty-eight or fifty feet high, and its magnitude required, it muſt be put in the ſame proportion as N has to I.

And inaſmuch as the laſt N only contains, two and a half of the ſix parts which I contains, this O upon the tower muſt only have two and a half of the ſix parts in the figure N.

If you would have another figure R on another tower forty-eight or fifty foot before the figure Q, take two parts and a half of the figure Q for the height of the figure.

If another were required in S, which is thirty feet high in the ſame tower, then take four of the ſix parts of the figure Q; that is, four foot, as already mentioned in the firſt method between the rays G and H.

What renders this rule the more valuable is, that all the proportions of figures may be learn'd by heart; for whoever would be at the trouble of making this meaſure, where he might add more parts, they would ſerve him for ever, and he would render them ſo familiar, that in a little time he would be able to tell off hand, that if you are at thirty-five feet diſtance, and the figure ſix feet or ſix parts high when on the ground; another that ſhall be of the ſame ſize, will only appear five foot and a half, when rais'd to the height of twelve feet; and but five, if rais'd eighteen feet; but four and a half, if twenty-four feet; but four, if thirty; but three, if thirty-ſix; and two and a half, if forty-two; and ſo on by ſix and ſix to any number you pleaſe.

To find the HEIGHT *of remote figures, whereof the firſt is on a mountain near the eye.*

It is a thing that gives a great deal of ſatisfaction to the mind, when a perſon knows what he does; on which account it is preſumed that the reader will be well enough pleaſed to have the following rule.

When ſuch figures are to be made, determine the height of the firſt, that is the ſpace of ground you would have it rais'd; and at that diſtance put another figure underneath, of the ſame height as the firſt; and from the feet and head thereof, draw lines to the horizon, by which you will have the heighth of the other figure in the champagne. To explain my ſelf,

The figure A for example, which is a top of a mountain, is five foot high, which is the natural height; and I ſuppoſe the mountain twenty-five feet high. If now a man be rais'd twenty feet, as is the piece in the middle, whereon the ſpectator is mounted (who himſelf is ſuppos'd to be five foot high) the horizon will be twenty-five foot high, as well as the mountain, and conſequently will raiſe the top of the mountain.

Now to find the height of the little people in the champagne, make a figure twenty-five foot lower, underneath the figure A, or in ſome other place, as B C; and from the feet B, and the head C, draw lines to ſome place in the horizon, as the point O; and between thoſe two lines B and C drawn to O, take the height of the figure D, draw a parallel to the baſe-line till it cut the line B in the point E, from which a perpendicular is to be rais'd, cutting the line C O in the point F; and take the height of this perpendicular E F for the height of the figure in the point D.

If you likewiſe require the height of the figures in the points G and H, proceed after the ſame manner as in the figure D, and you will have their heights between the lines B and C, to be taken in the compaſſes, and ſet off in the points G and H.

The ſame you are to do for any other figures, ſtill diminiſhing, till at length you come to a mere point.

HELLEBORE [in miniature.] The flower is done by laying on white, and ſhading with *black* and *biſtre*, making the outſide of the leaves a little *reddiſh* here and there.

The ſeed muſt be of a deep *green*, heightened with *maſticote.*

The green muſt be ſad, and is to be done with *verditer*, *maſticote*, and *biſtre*, and finiſhed with *iris-green* and *biſtre.*

EGBERT HEMSKIRK was born at *Harlem*, and diſciple of *De Grebber*. He became very eminent for painting drolls after the manner of *Brawer*. His comical genius ſucceeded for

a long

Plate XXVII.

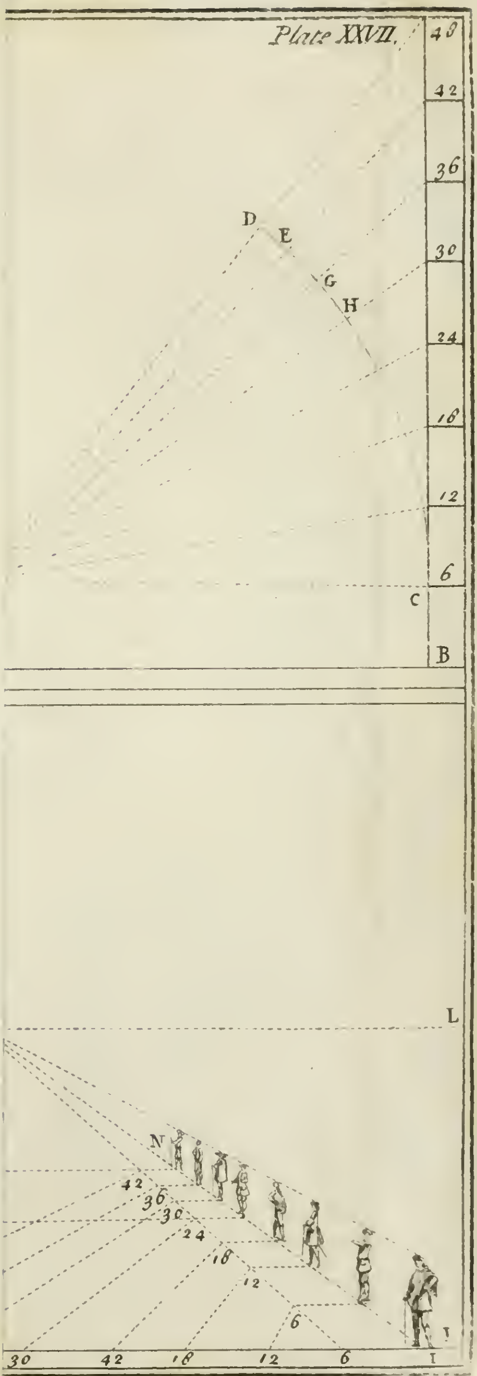


Plate XXVII

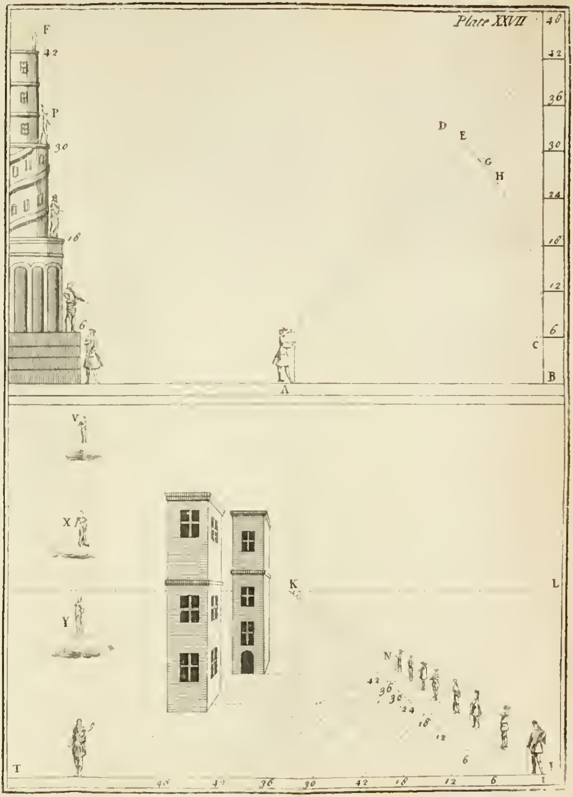

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Plate XXVIII

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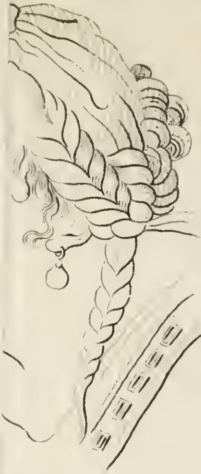
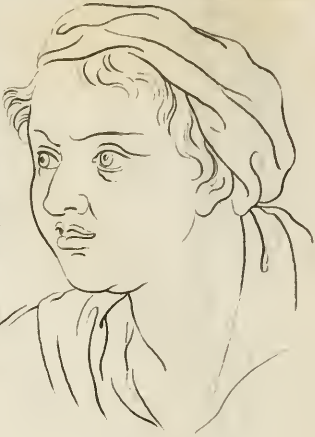
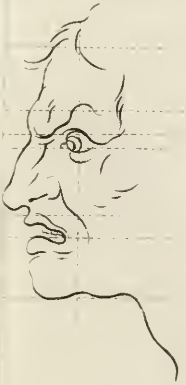


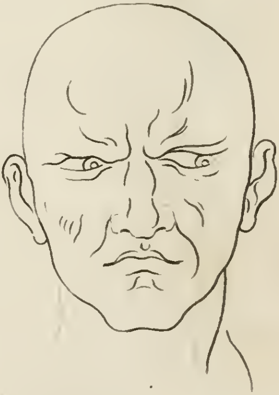
Hope.



Horrour.



Jealousy.



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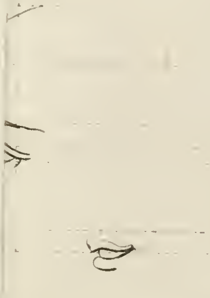

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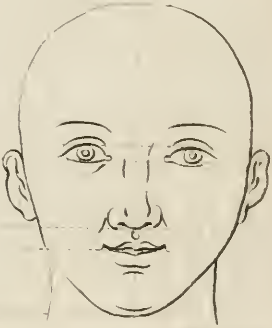
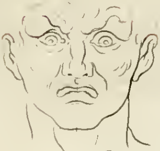
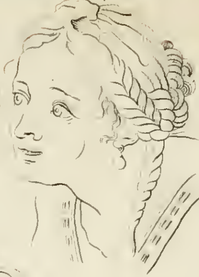


Plate XXVIII

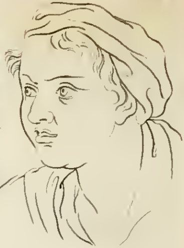
Horrour.



Hope.



Hope.



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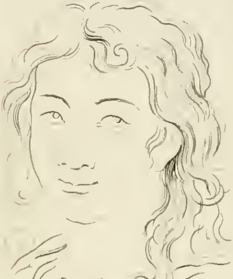

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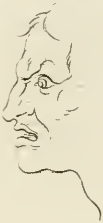
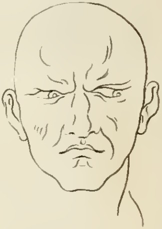
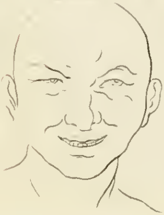


Jealousy



Laughter



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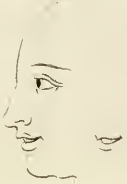

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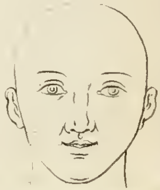
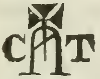


a long while amongſt us in moſt of his converſation-pieces; you may ſee all the pictures and read the manners of the men at the ſame time, a thing chiefly aim'd at. His drunken drolls, his wakes, his quakers meetings, and ſome lewd pieces have been in vogue amongſt waggiſh collectors, and the lower rank of virtuoſi. He often introduced his own picture among his drolls by means of a looking-glaſs he had upon his pallet. He was a man of wit, and therefore valued by the late Earl of *Rocheſter*, for whom he painted ſeveral pieces. He died in *London* about forty years ago, leaving behind him a ſon, whom he had inſtructed in his way.

MARTIN HEMSKERK, born in the year 1498, ſcholar of *Jean Lucas* and *Schoorel*, liv'd in *Holland*, excell'd in hiſtory, died in 1574, aged ſeventy-ſix years.

HERESY is repreſented in painting by an old, lean hag of a terrible aſpect, flames iſſuing out of her mouth, her hair hanging diſorderly about her breaſts, and moſt of her body bare; her dugs flagging; in her left hand a book ſhut up, ſerpents coming out of it, and with her right ſeems to ſcatter them abroad.

Her oldneſs denotes her inveterate malice, becauſe deprived of the light of faith; the flame denotes impious opinions; her breaſts ſhew that vigour is dried up, that ſhe cannot nouriſh good works; and ſcattering ſerpents, the diſperſing falſe doctrines.



CORNELIUS HEVISSEN us'd this mark.

JOHN VANDER-HEYDON was a good face-painter, and a native of *Bruſſels*, coming over to *England*, he worked for Sir *Peter Lely* in his draperies, and copying ſeveral years, till afterwards marrying, he went into *Northamptonſhire*, where he was employed by moſt of the noblemen and gentry of that country. There are ſeveral of his pictures to be ſeen in thoſe parts, eſpecially at my Lord *Sherrard*'s, and at the Earl of *Gainsborough*'s and at *Belvoir-caſtle*. He died about thirty years ago at my Lord *Sherrard*'s, and lies buried at *Stapleford* in *Leiceſterſhire*.

NICHOLAS HILLIARD was a celebrated *Engliſh* limner, drew Queen *Mary* of *Scots* in water-colours when he was but eighteen years of age, wherein he ſucceeded to admiration, and gained a general applauſe. He was both goldſmith-carver and limner to Queen *Elizabeth*, whoſe picture he drew ſeveral times; particularly once, when he made a whole length of her ſitting on her throne, which piece was deſervedly eſteemed. There are moreover two wonderful pieces of his, now in poſſeſſion of *Simon Fanſhaw*, Eſq; and by him valued, not without reaſon, as it's the opinion of good judges, at above fifty guineas each, tho' not much bigger than a crown. One of theſe is the picture of our artiſt himſelf.

The other is the picture of his father, ſometime High Sheriff of the city and county of *Exeter*.

Theſe two pictures in miniature are ſo maſterly done, that not only the faces are finely coloured, and naturally with a good relievo; but alſo the heads and beards are ſo well perform'd, that almoſt each ſingle hair is expreſs'd.

HISTORY [in painting] is a picture compos'd of divers figures or perſons, repreſenting ſome tranſaction or piece of *Hiſtory*, either real or feigned.

Painters are diſtinguiſhed into portrait-painters, flower and fruit-painters, landſcape-painters, painters of beaſts and *Hiſtory*-painters; and the firſt place or rank is univerſally allow'd to *Hiſtory*-painters, as the moſt difficult, maſterly, and ſublime province.

HISTORY-*Painter*. A good *Hiſtory-Painter* ought to underſtand all things, becauſe he is to repreſent all things; he ought to be naturally a quick, free, good inventor and deſigner, as alſo to know well how to order and ſtell his figures after that manner (if there be many in one piece) that they may not ſeem to be crowded; but to order them gracefully on the foreground eſpecially, and the reſt of the figures to leſſen and decline proportionably, both in height and ſtrength by degrees at their ſeveral diſtances.

And a *Hiſtory-Painter* muſt of neceſſity underſtand anatomy, arithmetick, architecture, geometry and perſpective, *&c.* and not only the true ſhape of man's body, but of all other creatures whatſoever, and all the ſhapes and forms that are in the world.

HISTORY is repreſented in painting by a woman reſembling an angel with great wings, looking behind her, writing on an oval table, on the back of *Saturn*.

The wings denote her publiſhing all events with great expedition; her looking back, that ſhe labours for poſterity; her white robe, truth and ſincerity; *Saturn* by her ſide denotes time, and the ſpirit of the actions.

WENCESLAUS HOLLAR was a gentleman born at *Prague* in *Bohemia* in the year 1607. He was much inclined to miniature and etching, in which laſt art he became exceeding famous. In the year 1627, he left *Prague*, and viſited many cities of *Germany*, when coming at laſt to *Colen*, he waited upon the Earl of *Arundel*, that truly great and noble patron of arts, who was there on his embaſſy to the Emperor at *Vienna*, and afterwards came over with him to *England*. He lived here for ſome time, and drew many churches, ruins, perſons, and views, which he afterwards etched, which will always be in good eſteem. His particular excellency was etching: there are a great number of his prints in *England*. He at laſt got into the ſervice of the Duke of *York*; but upon the breaking out of the civil wars, retired to *Antwerp*, and there died.

HANS HOLBEN. His manner was extraordinary and unuſual, differing both from the antients and moderns, ſo that it ſeems as if he had not been incited or inſtructed by any example, but rather that he followed purely the dictates of his genius. There is nothing to be ſeen of his doing but what is painted to the utmoſt perfection: this is manifeſt by that piece of his of death's dance in the town-hall at *Baſle*, the deſign whereof he firſt cut neatly in wood, and afterwards painted, which appear'd wonderful to the learned *Eraſmus*. He requeſted of him to draw his picture, deſiring nothing ſo much as to be repreſented by ſo judicious a hand.

This being perform'd, and *Eraſmus* thinking that he deſerved a more plentiful fortune, he perſuaded him to come for *England*; promiſing him conſiderable advantages from the bounty of King *Henry* VIII. At his requeſt, *Holben* ſet out for this kingdom, bringing along with him *Eraſmus*'s picture, and letters of recommendation from that great man, to the then Lord Chancellor Sir *Thomas More*, who received him with all joy imaginable, and kept him for three years at his own houſe; during which time he drew his picture, and thoſe of many of his friends and relations, all which were hung up in the great hall of that houſe. The King coming one day to dine with Sir *Thomas*, and at the entrance into the hall beholding ſo many raviſhing objects, the pictures ſeeming almoſt as live as the perſons, who were all there preſent, his Majeſty ſo much admired the excellency of the painter, that the next day he ſent for him, and entertained him in his ſervice upon very advantagious terms: the King from time to time manifeſted the great eſteem and value he had for him.

HANS HOLBEIN, born in 1498, ſcholar to his father, liv'd in *Switzerland* and *London*, excell'd in hiſtory and portraits, died in 1554, aged fifty-ſix years.

ABRAHAM HONDIUS, born at *Rotterdam* in the year 1638. He was a painter whoſe manner was univerſal; he drew hiſtory, landſcapes, ceilings and ſmall figures; among all the reſt, beaſts and hunting pieces were all his ſtudy. In all theſe kinds his colouring was often extravagant, and his draught as commonly uncorrect. He delighted much in fiery tinct, and a harſh way of penciling; ſo that few of his pictures being without this diſtinguiſhed mark, his paintings are eaſy to be known.

His dogs and huntings are in good requeſt, though ſome of his latter were careleſs, he being for many years afflicted with the gout ſo ſeverely, that he had prodigious ſwellings and chalk ſtones in moſt of his joints; the effects of a ſedentary and irregular life. This diſtemper occaſion'd his death in *London* about the year 1691.

HOPE is a ſtrong appearance or opinion of obtaining that which one deſires.

Extreme Hope becomes ſecurity; and on the contrary, extreme fear is turn'd into deſpair.

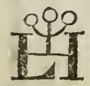
But the motions of this paſſion being not ſo much external as internal, we ſhall ſpeak but little of them, and only remark that this paſſion keeps all the parts of the body ſuſpended; between fear and aſſurance, in ſuch a manner, that if one part of the eye ſhews ſigns of fear, the other part intimates ſecurity; and ſo in all the parts of the face and body, the motions of theſe two paſſions are participated and intermix'd. See the plate.

HOPE is repreſented in painting by a beautiful young girl in a long robe, hanging looſe, ſtanding upon tip-toes, and a trefoil or three-leav'd graſs in her right hand, and an anchor in her left.

The looſe veſtment intimates, that ſhe never pinches or binds truth; her poſture, ſtanding on tip-toes, ſhews ſhe always ſtands dangerouſly; the branch of trefoil denotes knowledge (the ground of faith) faith (the ground of hope) and hope itſelf.

HOPE is alſo repreſented as a young woman, clad in green, with a garland of flowers, holding a little *Cupid* in her arms, to whom ſhe gives ſuck.

The flowers denote *Hope*, they never appearing without ſome hope of fruit; the *Cupid*, that love without hope grows languid, and is not laſting, as on the contrary, 'tis deſperate, and ſoon at an end.



LAMBRECKT HOPFER, a *German*, engrav'd all kinds of ſubjects. Sometimes his mark is a vaſe of flowers in the midſt of the letters L H or the perpendicular ſtroke of the L ſtruck off the H. He engrav'd twenty-ſeven pieces on the paſſion.

To ſoften HORNS.

Take urine a month old, *quick lime* two pounds, *calcin'd tartar* one pound, *crude tartar* and *ſalt* of each half a pound; mix and boil them all together; then ſtrain out the liquor twice or thrice; put in the horns, let them lie and ſoak for eight days, and they will become ſoft.

Another way.

Take *aſhes*, of which glaſs is made, and *quick lime* of each two pounds; boil them in a ſufficient quantity of water, till one

Plate XXIX.

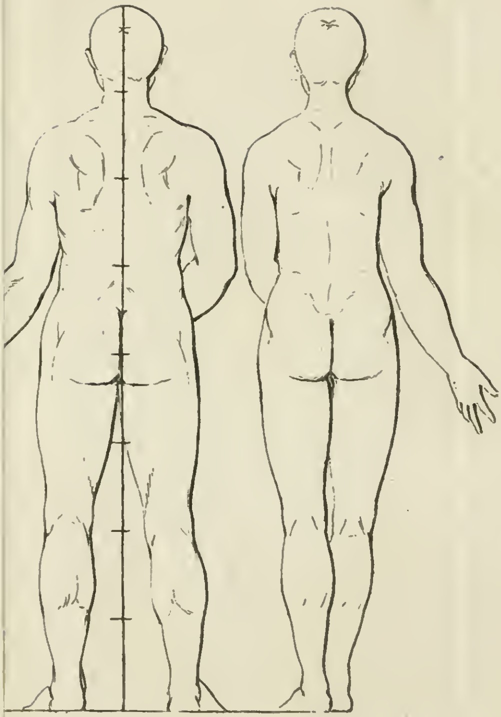
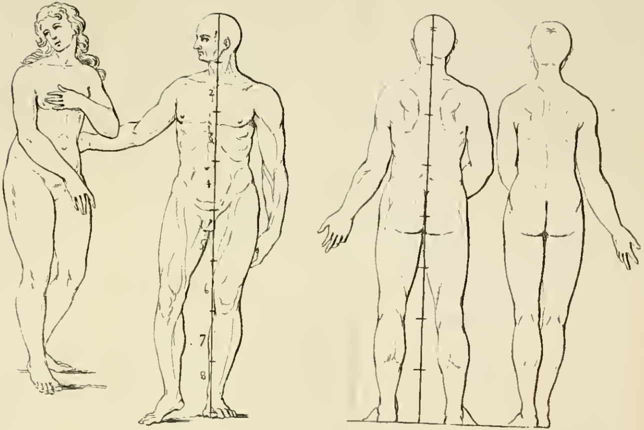


Plate XXIV.



hird part is conſum'd ; then putting a feather into it, if it peels, is boil'd enough ; if not, boil it longer ; and when it is enough, arify it, and pour it off, and put fileings of horn in it for two ays ; anoint your hand with oil, and work them as if they ere paſte, and into what form you pleaſe.

Another way.

Mix juice of *marubium*, *alexanders*, *yarrow*, *celandine* and *diſh roots* with ſtrong *vinegar* ; put in the *horn*, and let them geſt for a week in horſe-dung, and then you may work them before.

To caſt HORN *in a mould like lead.*

Make a *lixivium* of *calcin'd tartar* and *quick lime* ; into this it your fileings or ſcrapings of *horn* ; boil them well together l they come to a pap, tinge this of what colour you would ave it, and you may afterwards caſt it in a mould, and make it any thing of what form you pleaſe.

To dye HORNS, *&c.* RED.

Firſt boil the horns in *alum water* ; then put it into tincture *Brazile* in *alum water* for fourteen or twenty days, or into tincture of *Brazile* and *milk*.

To dye HORN BLUE.

Firſt boil it in *alum water*, then put it into a diſſolution of *ndigo* in *urine*.

To dye HORN *of an emerald* GREEN.

Put as much fileings of *copper* into *aqua fortis* as it will diſlve, then put in the *horn* for one night.

HOROGRAPHY is repreſented in painting by a young irgin winged, clothed in a ſhort robe of ſky colour, with an our-glaſs on her head ; in her right hand ſhe holds inſtruments r dialling, and in her left hand a ſun-dial ; the ſun over her ad ſhewing with its rays the ſhadow of the gnomon directed to e hour current.

Her youth denotes the hours continually renewing their courſe cceſſively ; the curtail'd coat and wings, the rapidity of the urs ; the ſky-colour, the ſereneneſs not prevented by clouds ; e hour-glaſs ſhews the time of night, as the other does that the day.

HORROR, an object deſpiſed or ſcorn'd ſometimes cauſes *Iorror*, which, if inſtead of *ſcorn* it raiſes *Horror*, the eye-row will be ſtill more frowning than in that of *ſcorn* ; the eye-row will knit and ſink a great deal more, and the eye-ball, inead of being in the middle of the eye, will be drawn down the under-lid ; the mouth will be open, but cloſer in the middle than at the corners, which being drawn back, makes wrinles in the cheeks ; the colour of the viſage will be pale, and the lips and eyes ſomething livid. This action has ſome reſemblance to *terror*. See the plate.

In *Horror*, the motions ſhould be much more violent than in *ſcorn* or *averſion*, the body violently retiring from the object which cauſes the *Horror*. The hands ſhould be wide open, and the fingers ſpread; the arms drawn in cloſe to the body, and the legs in an action of running.

To dye or colour HORSE-HAIR, *or any hair*, &c.

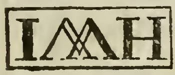
Steep the hair in water, in which a ſmall quantity of *turpentine* has been boil'd for the ſpace of two hours; then the colours being prepar'd and made very hot, boil the hair therein, and any colour will take, *black* excepted, and that will only take dark *red* and dark *blue*, &c.

And after this manner with colours cold, or but luke-warm, you may dye the feathers upon the backs of poultrey, wild-fowl, hair on dogs, horſes or the like, and in as much variety as your fancy ſhall lead you to.

JOHN HOSKINS was an eminent limner in the reign of King *Charles* I, whom he drew with moſt of the court. He was bred a face painter in oil; but afterwards taking to miniature, he far exceeded what he did before. He died in *Covent-Garden* about eighty years ago. He had two conſiderable diſciples, who were *Alexander* and *Samuel Cooper*, the latter of which became the moſt eminent limner.

HOSPITALITY is repreſented in painting, by a lovely woman, her forehead ſurrounded with a crown ſet with jewels, with her arms open to relieve ſomebody; holding a *cornucopia* full of all neceſſaries, clad in white, and over all a red mantle, under which ſhe holds an infant naked, ſeeming to participate ſome of the fruit with her, and a pilgrim lying on the ground.

Her handſomeneſs intimates, that works of charity are acceptable to God; the golden circle denotes her thinking of nothing but charity. Her white raiment ſhews, that *Hoſpitality* ought to be pure.



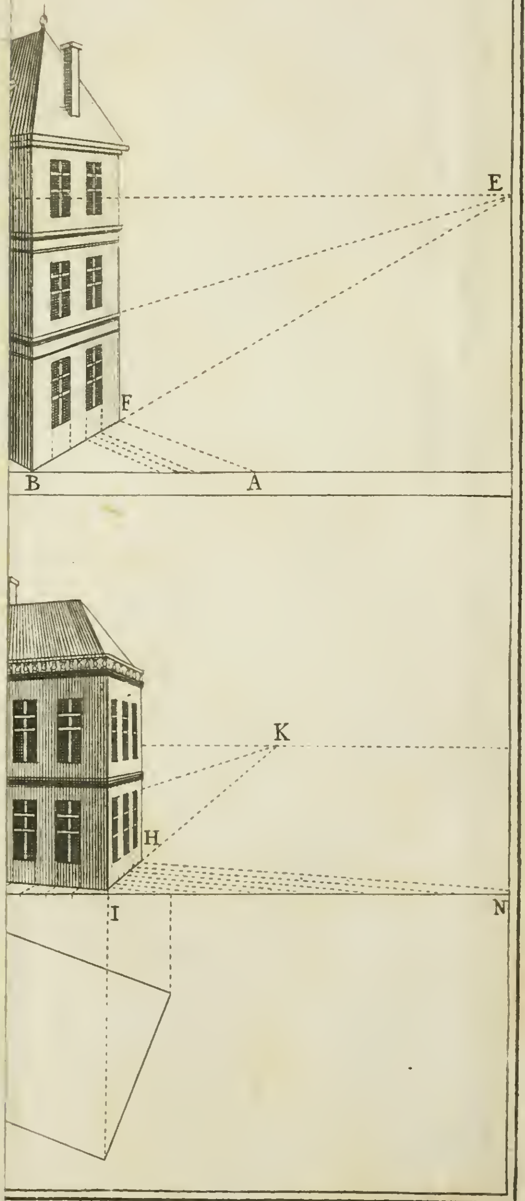
VUAER VAN HOSSANEN, engrav'd twelve round plates of the Paſſion, and underneath various ſymbols of our Saviour. He likewiſe engrav'd the life of Chriſt in ſixty plates. He us'd this mark.

HOUSES *or* BUIDINGS *view'd by the angles in perſpective.*

Of theſe two buildings ſeen angle wiſe, the firſt is perform'd after the manner of ſquares view'd the ſame way, and elevations of other things in ſide views.

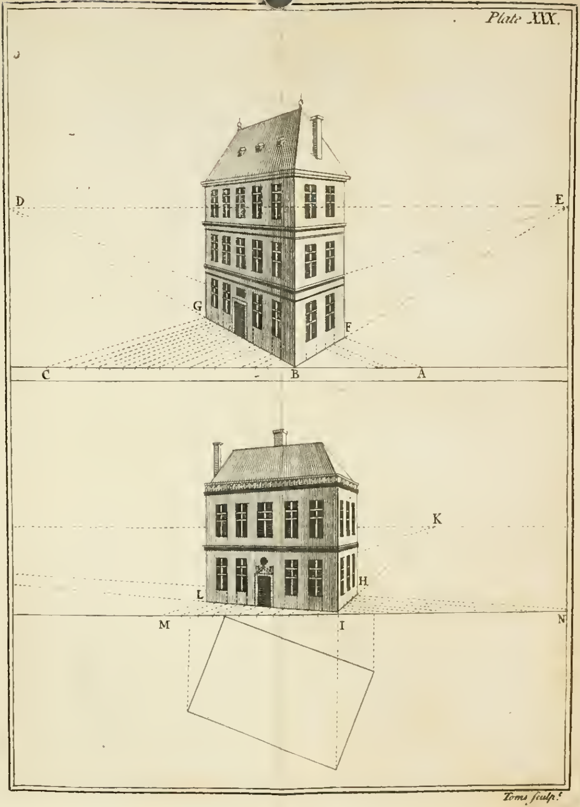
However, to ſave the trouble of recurring to the one and the other, I ſhall here obſerve, that to perform ſuch buildings, the meaſures muſt be ſet on the baſe line, and from each of them

Plate XXX.



Toms sculp.t

Plate XXX.



Toms sculp.

lines are to be drawn to the point of diſtance; and from the points of interſection, perpendiculars are to be raiſed; the firſt angle ſerving for a line of elevation.

Thus in the preſent building the breadth being A B, and the length B C double its breadth; from A and B lines are to be drawn to the point of diſtance D; and from B and C to the point of diſtance E.

Then obſerving where B D or B E are interſected thereby; raiſe the poſts of the windows therein. The perpendicular of the firſt angle B ſerving for a line of elevation, will give the croſs pieces and the height of the windows, the reſt is obvious.

As to the figure underneath, the method is the ſame as for chairs plac'd irregularly, *i. e.* having made the plan put it in perſpective, as irregular objects are put; then laying a ruler along each ſide of the plan, obſerve where it cuts the horizon, and marking the points draw lines thereto from each part of that ſide of the building.

Every face or ſide of a building has its particular point.

Thus the plan being put in perſpective; the ſide H I gives the point K on the horizon, to which all the rays on that ſide muſt be drawn.

The other ſide I L, ſhould likewiſe have its point; but for want of paper room it could not be here expreſs'd.

Having found theſe two points, lay a ruler upon it, and an occult line over the other ſide of the building parallel upon the plan, parallel to that which gave the point in the horizon, and continue it to the baſe line, as from R through L to M; and from the other point continue an occult line through H to N.

Then ſetting the number of windows on the ſide H I, between N and I, and between I and M ſetting the number of the windows on the ſide I L; draw lines from all theſe points or meaſures on the baſe line to the point in the horizon, and proceed as in the figure above.

JAMES HOUSMAN alias HUSYMAN was a hiſtory and face painter, who reſided in *England* in the time of Sir *Peter Lely*, and endeavoured to rival in the portrait way. He was born at *Antwerp*, and bred up to painting under one *Bakerrel*, who was brought up with *Van Dyck* in the ſchool of *Rubens*. This *Bakerrel* was not much inferior to *Van Dyck*, as is to be ſeen in ſeveral churches in *Antwerp*, eſpecially of that of the *Auguſtin* monks, where *Van Dyck* and he have painted to out do each other, and both had commendations in their different ways; though the ſuperiority was yielded to neither. But *Bakerrel* being a poet as well as a painter, he wrote a ſatyr upon the jeſuits on which account he was forced to leave the city of *Antwerp*, ſo that *Houſman* having by that means loſt his maſter, came for *England*; ſome of his hiſtory pieces are well painted, his colouring being bright and ſanguine, and in the airs of his faces he out did moſt of his countrymen, who often know better how to perform the painting part, than to chooſe the beſt life or execute agreeably any deſign; ſome cupids of his were much admired, but what he valued himſelf moſt upon was the picture of *Catherine* the Queen Dowager of *England*. This picture did him great ſervice, ſo that he was always boaſting of that performance, he call'd himſelf her Majeſty's painter. He carried the compliment yet farther, for in all hiſtorical pieces for a *Madonna*, a *Venus*, or any ſuitable figure, he always introduced ſomething of her reſemblance, the moſt famous piece of his performance was over the altar of that Queen's chapel at St. *James's*, now a *French* church. He died in *London* about fifty years ago, and lies buried at St. *James's*.

H. S. 1558. ſtands for *Hercules Septimus Mutinenſis*, in certain figures and ornaments of building.

H. V. C. 1517. ſignifies *Hans vel Culihac*, who was ſcholar to *Albert Durer*.

HUMILITY is repreſented in painting, by a virgin all in white, her arms acroſs upon her breaſt, her head inclined, a golden crown at her feet.

The white robe ſhews the purity of the mind, begets ſubmiſſion, holding down her head, confeſſion of her faults; treading on a crown ſhews *Humility*, diſdaining the grandeur of the world.

HYACINTH. The flower is of four ſorts:

1. A deep blue.
2. A paler blue.
3. A gridelin.
4. A white.

To paint them in *miniature*.

For the firſt uſe *ultramarine* and *white*, ſhaded and finiſh'd with leſs *white*.

For the ſecond, make that of a paler blue.

For the third, uſe *lake* and *white* and a very little *ultramarine*, and finiſh it with the ſame colours; but of a deeper degree.

The fourth muſt be all white, and then ſhaded with *black* and a little *white*; finiſh with ſtrokes of the ſame turn, with the out-line of the leaf.

The green and ſtalk of the blue kind, muſt be of the ſea ſort, ſhaded with a very deep *iris*, and in the ſtalk of the firſt, you uſe a little *carmine* to give it a reddiſh caſt.

The ſtalks of the two others, and their greens muſt be cooured with *verditer* and *maſticote*, ſhaded with *bladder green.*

HYDROGRAPHY is repreſented in painting, by an ancient matron in a cloth of ſilver garment, the ground of which reſembles the waves of the ſea; ſtars above, in one hand a chart of navigation and the compaſſes; in the other, a ſhip and the mariners compaſs on the ground before her.

Her garment ſignifies the water and motion thereof, which is the ſubject of *Hydrography*; the compaſs the regulating and deſcribing by the help of it; the chart ſhews all the winds, and the ſureſt way to ſail.

HYPOCRISY is repreſented in painting by a meagre pale woman in a linſy-woolſy garment, her head inclining to the left; her veil covers moſt of her forehead, with beads and a maſs book; ſhe puts forth her arm in the aſſembly to give a piece of money to ſome poor body with legs and feet of a wolf.

Linſy-woolſy, the linen denotes malice, and the woollen ſimplicity; her head inclined, with the veil covering her, all ſhew *Hypocriſy*; the offering money, vain glory; her feet, that outwardly ſhe is a lamb, but inwardly a ravening wolf.

FINIS.

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